FLIGHT

MAGAZINE

FEBRUARY 1959

50 cents

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Cont. Copy

BEECHCRAFT K35 BONANZA

This pipeline man wanted to know:

WILL A BELL SAVE ME MONEY?

At some point, most pipeliners take a long look at their ordinary equipment and the thought comes to mind: What about a helicopter? In the case of this Oklahoma construction company, the boss was looking, also, at a contract just signed . . one calling for a 30-inch gas line across 343 miles of mountains in Alabama, Tennessee and Kentucky.

What the company did was *charter* a Bell. From there on, discovery followed discovery. On the first day out, after spotting a broken-down bulldozer, the Bell flew in mechanics and parts for quick repair. Then it started shuttling spread-superintendents to work sites, helping engineers keep track of progress, jumping here and there to haul in a tool or bring out an ailing workman. Just its hovering presence gave the entire job the feel of being under control.

This Oklahoma company now uses a Bell on four other spreads, in such new-found ways as hunting out roads, ferrying survey crews, flying in inspectors and personnel. How about the value of a Bell in your own operation? Charter is a low-cost way to find out. We'll be glad to send you names of Charter Services in your area, along with additional information on Bell models and other convenient ways to try the Bell. Simply write Dept. 12B, Bell Helicopter Corporation, Fort Worth, Texas.

BELL Helicopter CORPORATION

FORT WORTH, TEXAS

SUBSIDIARY OF BELL AIRCRAFT CORPORATION

TA-21A VHF TRANSMITTER, 360 channels (50 kc spacing). 25 watts output. Short ⅜ ATR package. (ACTUAL SIZE)

RA-21A VHF RECEIVER. 560 channels (50 kc spacing). Short ¼ ATR package. Also provides r-f and audio circuitry for automatic VOR and LOCALIZER systems.

The Smallest, Lightest and Finest in VHF Communications Equipment for business and airline aircraft.

For further information write

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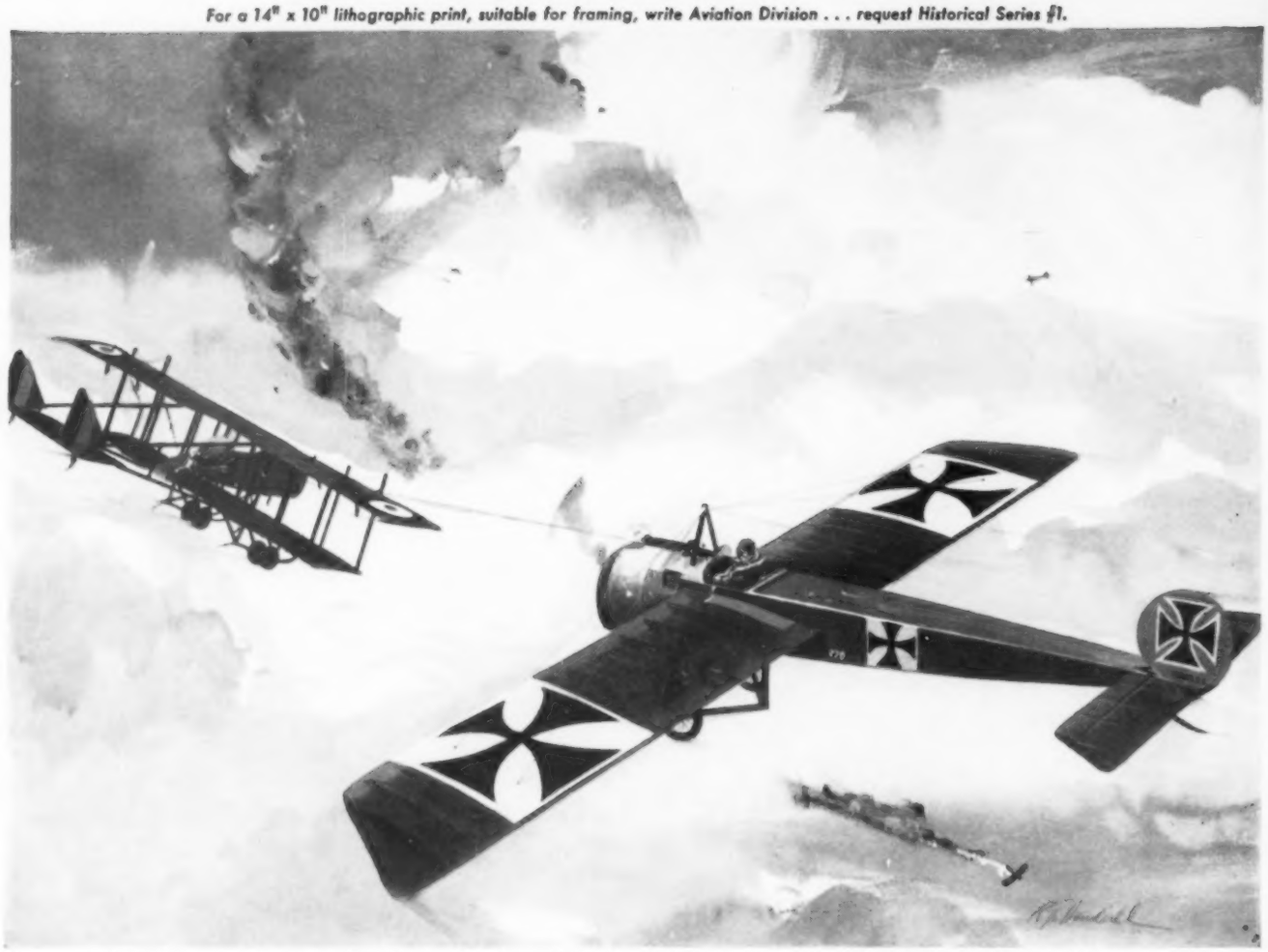
Baltimore 4, Maryland

Bendix AVIATION CORPORATION

Export Sales & Service: Bendix International Division, 205 E. 42nd St., New York 17, N. Y.

For a 14" x 10" lithographic print, suitable for framing, write Aviation Division . . . request Historical Series #1.



The first use of a gun synchronized to fire through the propeller . . . by Lieutenant Oswald Boelcke in a Fokker E-1

Early War Birds— THE FOKKER E-1

This plane, designed by Anthony Fokker, was rejected by Dutch, English, French and Russian military prior to World War I. Germany on the other hand, received Fokker's "Eindekker" enthusiastically, designated it the E-I, and thereby acquired the services of this original and brilliant Dutch designer throughout the war. The E-I, powered with an 80 h.p. rotary engine, had a top speed of 80 m.p.h. at 6,000 feet. While its airframe was not strong enough to withstand a prolonged power dive and its engine was cranky and inefficient, it was still one of the better single-seaters when the fighting began.

In February, 1915, the Germans asked Fokker to equip his plane with a machine gun that would shoot through its revolving propeller similar to a French plane that they had just captured. The French used steel plates on the propeller to deflect any of the bullets that might strike the whirling blades. Fokker rejected their method as impractical, and in 48 hours had equipped an E-I with the first truly synchronized gun.

Oswald Boelcke (later to become one of Germany's greatest aces and earliest proponent of squadron flying) flew the trial mission and easily claimed the first victim for the synchronized gun. The fighter plane or "flying gun platform" had come into being. For the next four months Germany dominated the skies. Then the Allies learned the secret from a captured plane. Soon both sides were armed with synchronized guns, and the dog fighting began in earnest.

Phillips 66

A pioneer in the development of aviation fuels, Phillips Petroleum Company is today a leading supplier of high octane gasoline for commercial, private, and military aircraft . . . and of *super-performance* jet fuels for turbo-props and jets. And Phillips research continues to lead the way, developing new fuels for the aircraft of tomorrow.

AVIATION DIVISION • PHILLIPS PETROLEUM COMPANY • BARTLESVILLE, OKLAHOMA

AIR Report
Significant Trends and News

AIRCRAFT RADIO CORPORATION of Boonton, N. J., pioneer in aircraft radio development and producer of quality lightweight communications and navigation electronic equipment, became a subsidiary of Cessna Aircraft Company on Feb. 1 after stockholders of both ARC and Cessna approved the deal. Each ARC stockholder received two shares of Cessna stock in exchange for three shares of ARC stock. ARC will continue to operate at Boonton with no change in management.

FEDERAL AID TO AIRPORTS AMOUNTING TO $575,000,000 is provided in Senate Bill S-1 introduced by Senator Mike Monroney.

LIGHT TWIN-ENGINE BUSINESS PLANES NUMBERING 870 AND WORTH OVER $54,000,000 in retail value were sold during 1958 by Aero Design, Beech, Cessna and Piper. The deliveries were as follows: 97 Aero Commanders worth $7.9 million; 293 Beech Travel Airs, Twin-Bonanzas, Super 18's and a twin-jet MS-760, all worth $22,559,983; 176 Cessna 310's worth $11,982,800, and 304 Piper Apaches worth $12,333,630. Of the 870 twins, 652 were small twins selling for less than $60,000 — 304 Piper Apaches, 176 Cessna 310's and 172 Beech Travel Airs.

BEECH ACCELERATED BUSINESS AIRCRAFT PRODUCTION DURING JANUARY to keep pace with orders exceeding expectations and received a $23,000,000 follow-on production contract from Convair for Air Force F-106 aft fuselage sections and other major assemblies.

SMALLEST TWIN-ENGINE BUSINESS PLANE TO CROSS THE PACIFIC OCEAN is a Piper Apache owned by Aero Service Corp. of Philadelphia and equipped with a 6-ft. tail cone to house magnetometer mineral surveying equipment. It was flown from Oakland to Seoul, Korea, by Jack Ford, chief pilot for Skyways Aircraft Ferrying Service of Van Nuys, Calif., and Walt Henderson, Skyways' chief navigator. They carried 200 gals. of extra fuel in cabin tanks. The 8,300-mile flight was made in the following stages: Oakland to Honolulu, 17 hrs. 16 mins.; Honolulu to Wake Island, 14 hrs. 36 mins.; Wake Island to Tokyo, 14 hrs. 25 mins.; Tokyo to Miho, Japan, 3 hrs. 56 mins.; Miho to Seoul, 3 hrs. 38 mins. Aero Service will conduct mineral surveys in Korea. It is the world's largest aerial survey com-

(Continued on page 8)

Las Vegas Pilots Stay Aloft After Surpassing Old Endurance Record of 1,200 Hours in Cessna 172

A new world's record for flight endurance was being expanded in early February by Pilots Bob Timm and Bill Cook of Las Vegas, Nevada, in a 4-place Cessna Model 172 powered by a 145-hp. Continental engine. They took off on Dec. 4, 1958, and had stayed aloft 1,470 hours as of February 3, 1959, continuing in flight with no indication of landing soon.

The old endurance record of 1,200 hrs. 16 mins. was established on Sept. 21, 1958, at Dallas by Pilots Bill Burkhart and Jim Heth in another Cessna 172.

Timm and Cook are making their endurance flight for the benefit of the Damon Runyon Cancer Fund, which receives all proceeds from a contest in which the public donates money for the privilege of guessing the flight's duration. The closest estimate wins $10,000 cash. The Hacienda Hotel is sponsoring the flight, with Movie Actor Preston Foster as chairman, assisted by Dick Taylor and Warren Bailey of the Hacienda.

According to Charles Hoefelmann, Phoenix manager of General Aviation Supply, who flew alongside Timm and Cook for a radio chat, the Las Vegas Cessna 172 is refueled from a gas truck while making low passes on a desert road at nearby Blythe, California. The pickup nets 100 gals. on an upwind pass and 50 gals. on a downwind pass. Alamo Airways installed a belly tank on the Cessna — the type of tank used by agricultural airplanes for chemicals.

Both the Dallas Cessna, which held the old record, and the Las Vegas Cessna were equipped with the transistorized Mitchell autopilot.

FLIGHT MAGAZINE

FEBRUARY, 1959 VOL. 48, No. 2

THIS MONTH'S COVER features the new Beechcraft Model K35 for 1959, popular 4-place, 250-hp., 210-mph. lightplane which has a useful load of 1,118 lbs. at a 2,950-lb. gross weight and a 1,245-mile range at 55% power, 180 mph. and 10,000 ft. on 68 gals. of fuel. The $25,300 K35 features Continental's fuel-injected 10-407C six-cylinder engine and a baggage compartment jump seat for a fifth occupant is optional.

—(Beech Photo by Jim Yarnell.)

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GEORGE E. HADDAWAY, Editor-Publisher; TOM ASHLEY, Managing Editor; FRED N. STONES, JR., Business Manager; LOUISE ROBERTSON, Circulation; E. H. PICKERING, Consultant; P. O. Box 750 (2700 N. Haskell Ave.), Dallas, Texas — Telephone TAylor 3-6191.

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Spray plane approaches Lake George hyacinth bed low and slow.

Florida's Winged Watchdogs

Airboat eradicates waterway-clogging hyacinths with spray-hose.

National publicity resulted recently (LIFE, etc.) when Wildlife Officers successfully restocked forest with wild turkeys via airlift.

by HERB FISHER

international aviation authority, veteran test pilot, author

An inside report on the Aviation Section of the Florida Game and Fresh Water Fish Commission... another in a series on why business and private aircraft, like the world's major airlines, use Champion Spark Plugs

Ever fly the Everglades—five feet off the water?

Pluck shipwreck victims from choppy seas? Hedge-hop the "green side of hell" by night? Spray low in a fixed-wing with flaps down? Airlift wild turkeys? Fly "queen-bee" for patrol boats converging on fish and game law violators—or fleeing criminals? Flush ducks—count and identify them—on a low pass? Strafe "rough fish" with poisonous chemicals?

Or wade armpit-deep in a pit-of-terrors—alligators, quicksand, leeches, venomous moccasins and mosquitoes using your head for a GCA? Maintain, singly and as a unit, your own aircraft or airboat—major engine and airframe overhaul to simply finding "the bug"? Lecture, do reams of reports?

Mr. Fisher

Flying Wildlife Officers of the Florida Game and Fresh Water Fish Commission's Aviation Section do some of it all of the time and all of it some of the time.

They're picked men: No margin for error in this diverse precision work. Takes intense concentration, unusual skill . . .

Picked machines—aircraft, parts and equipment; "swamp-buggy" airboats, "kicker" motorboats—backed by a remarkable maintenance operation. For

there's no place for breakdown . . .

Chief of Aviation, Chief Pilot and Chief A & E Mechanic is William S. Durkee, an old pro with single- or multi-engines, land or sea—commercial, military and barnstorm.

Immediate responsibility of Durkee's crack outfit is the security and progress of four million acres of Florida wildland, peppered by 30,000 named lakes laced by stream and marsh. But assisting federal, military and other state agencies is routine:

Like when fire menaces life and property in a national forest. Or in Civil Defense emergencies. Or when lawmen are after somebody or something in the back-country. Or when migratory waterfowl need a federal census. Or, jurisdictionless, when human life hangs by a hair in swamp, forest or Gulf . . .

Seven pilots, four A & E mechanics, eight planes do it. All are on 24-hour call—and, sometimes, duty. Headquarters, centrally located: Ocala Airport.

There, in a well-equipped hangar *pilots and mechanics built*, beyond call of duty, the Aviation Section not only gives major engine and airframe overhauls to all its planes, but also to airboat engines, majored at 600 hours! The Commission operates 62 airboats.

A typical three-month period, from the pilot log: Day patrol, 607 hours; night patrol, 52 hours; hyacinth spraying, 27 hours; aerial photography and survey, 62 hours. For this same period, the *pilot* log shows 9,000 miles' ground patrol, 425 hours for special office duties, 550 hours assisting other departments—900 hours on *maintenance*.

"In addition to maintenance and flying qualifications that many pilots just don't have, our pilots must have—and they do have—a genuine interest in game and fish conservation," Durkee stressed. "Top pilots, top mechanics, heroes of rescue that we insist remain anonymous—yes, they're all these and more. But first and foremost, they're Wildlife Officers."

Flying Wildlife Officers, whose two-way radio communication with all units—air, land, water—makes possible a highly coordinated operation—vital, in fact, to enforcement and rescue phases.

A 70-mph airboat on patrol in hazardous Everglades. Airboats run 600 hours on Champions used in aircraft for 300 hours!—a unique and grueling "double-life" for spark plugs.

Despite constant hazard, the Aviation Section has flown 10,000 hours without major accident. It was founded 3½ years ago as an outgrowth of a one-plane operation begun in 1948. Patrol and spray flights now exceed 5,000 hours and 115,000 square miles annually.

Firing this air-water-land force to life day and night are spark plugs indicative of the Commission's uncompromising policy on men and equipment: Typical of procedure, the Aviation Section tried several types to determine for themselves the most dependable for the vital heartbeat of the engine — ended up with Champion Spark Plugs exclusively. In plane, airboat, motorboat, truck, jeep, patrol car, shop equipment.

And herein lies a "double-life" saga unique in performance annals: Despite these severe operating conditions, the Commission runs Champions 300 hours in its aircraft—four Pipers, three Cessnas and a pontooned Stinson—then "bumps them down" and runs them another 600 hours in airboats! And when these airboats come in for a 600-hour major, their aircraft engines are worn out!

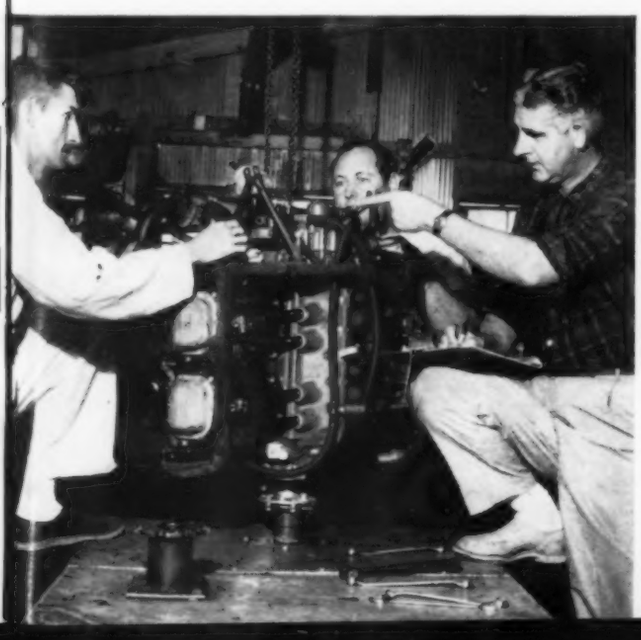
"Frankly, I don't see how these airboats give peak performance for 600 hours—you should see some of them in for overhaul," Durkee said. "And the beating the spark plugs take for 300 hours in low, slow *flying*, with high cylinder-head temperatures, then full throttle—then to run another 600 hours in poorly cooled airboat engines! Patrol airboats sometimes run 70 mph—and hyacinth-control airboats often turn up 3,200 rpm's blasting and rocking off mud flats. Add hot weather and salt-air humidity to that cylinder temperature, too!

"Here's a 900-hour 'double-life' on heavy engine-load both ways—plane and airboat—and, often we remove plugs before we really need to!"

They take no chances. Airboat engine failure can be almost as perilous as an aircraft forced-landing, especially in the Everglades. Took an airboat officer 30 hours to slog seven miles once . . .

Its peak performance has made the Aviation Section an important integral part of Florida's nationally acclaimed conservation and enforcement program.

Those responsible are the winged watchdogs of a wilderness wonderland.

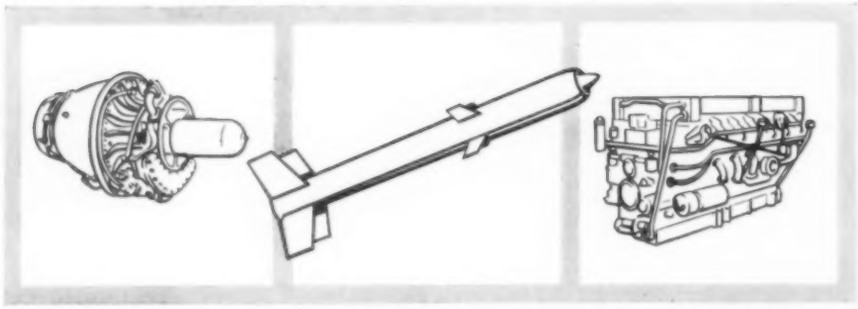


Pilots and mechanics work together to maintain own planes plus 62 airboats — from airframe to major engine overhaul! Pilot-mechanic William S. Durkee (R), Chief of the Commission's Aviation Section, supervises and pitches in.

CHAMPION SPARK PLUG COMPANY • TOLEDO 1, OHIO

CAE POWER

- Research
- Development
- Production



TURBINE RAMJET RECIPROCATING

● Continental Aviation & Engineering Corp. is exceptionally well qualified, both by experience and by facilities, for work on the weapons systems of tomorrow. Our background embraces not only a half-century of internal combustion engine experience, but also years of pioneering in gas turbine engine development, and a full decade of work in the field of solid fuels for ramjet propulsion of missiles and target drones . . . Continental is staffed and equipped for a wide range of assignments, military and commercial. The Detroit Division Research and Development Department is supported by our modern-to-the-minute Component Testing Laboratory complete with environmental facilities located at Toledo. The Toledo Production Division now producing various turbine engines in volume is capable of supporting diversified programs . . . The CAE record of achievement is one of which many a larger company might be proud. Inquiries are invited from those having propulsion problems, on the ground, on the water, in the air.

☆ ☆ ☆

CONTINENTAL AVIATION & ENGINEERING CORPORATION
12700 KERCHEVAL AVENUE, DETROIT 15, MICHIGAN
SUBSIDIARY OF CONTINENTAL MOTORS CORPORATION

AIR REPORT

(Continued from page 5)

pany, operating a fleet of 35 airplanes worldwide. The first Apache delivered to Korea was flown there last summer via the Aleutians by Max Conrad.

APRIL 1 IS NEW DEADLINE for pilots with "old style" flight instructor ratings to convert them to flight instructor certificates without further showing of competence. After April 1, holders may exchange them only upon demonstrating continued competence to give flight instruction.

MACH 3-5 AIRLINERS CAN BE DELIVERED BY 1965 if ordered now, Convair Engineering Vice President R. C. Sebold told the Institute of Aeronautical Sciences last month. He said 2,000-3,000-mph. airliners will make slower Mach 2 designs economically unattractive and that the leap to supersonic airliners will probably by-pass the 1,000-mph. category. Mach 3-5 airliners will change the world's travel habits.

WORLD'S LONGEST CROSS-COUNTRY FLIGHT BY A TURBO-PROP LIGHTPLANE was made recently by an Army Cessna L-19 Bird Dog powered by a small Boeing turbine driving a propeller. The pilot was Major Jack Cranford, flight operations officer for the Army Aviation Board at Ft. Rucker, Ala., and he flew at 20,000 to 27,000 ft. with frequent stops along the route, which was 2,950 miles from Seattle to Alabama, accompanied by an Army de Havilland Otter carrying JP-4 fuel for ground servicing of the Cessna. The Boeing-powered L-19 will be used at Ft. Rucker as a training vehicle prior to delivery of the Army's new propjet aircraft.

LOCKHEED HAS SELECTED THE PRATT & WHITNEY JT-12 JET ENGINE to power its 600-mph., 12-place Jetstar utility transport. The Jetstar will mount four of the JT-12's, each weighing only 430 lbs. but rated at 3,000 lbs. of static thrust. Normal gross weight of the Jetstar is 30,680 lbs., at which it will take off in only 2,800 ft. and will have a 1,900 mile range. Maximum gross weight is 38,000 lbs. for 3,000-mile range at which take-off distance is said to be 4,500 ft.

GENERAL AVIATION ADVISORY COMMITTE will be appointed by Federal Aviation Agency Administrator E. R. Quesada to advise him and FAA on general aviation requirements. The committee will be composed of five outstanding citizens drawn from the broad field of general aviation and will serve for one year, holding four or five meetings in Washington and meetings in other locations to discuss specific items as requested by the FAA adminstrator.

GENERAL AVIATION COUNCIL is the new name of the former Gen-

(Continued on page 54)

TO CORPORATE OFFICERS AND CHIEF PILOTS:

Quality, a word too often built up, is built into both the Gulfstream and its Rolls-Royce Dart engines. This modern aircraft, with fail-safe construction, typifies the reliability inherent in Grumman products for 29 years; while the engines have already been proved by millions of hours of airline operation. The achievements by these two leaders in their respective fields assure you of quality and safety in a true sense of the word.

The new Grumman Gulfstream, the optimum in executive transportation, features high air speed, pressurization and short field characteristics designed specifically to meet your corporate flying requirements.

Henry J. Schiebel
Sales Manager
Grumman Aircraft Engineering Corporation
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Grumman Gulfstream: 10-12 seat executive transport. Cruise: 350 mph. Power: two Rolls-Royce Dart (R.Da.7/2), take-off rating 2105 ESHP. Range: 2,200 miles plus reserve. Pressurized: 5,500 feet at 25,000. Operates from 4000 ft. runways and within existing and future Air Traffic Control.

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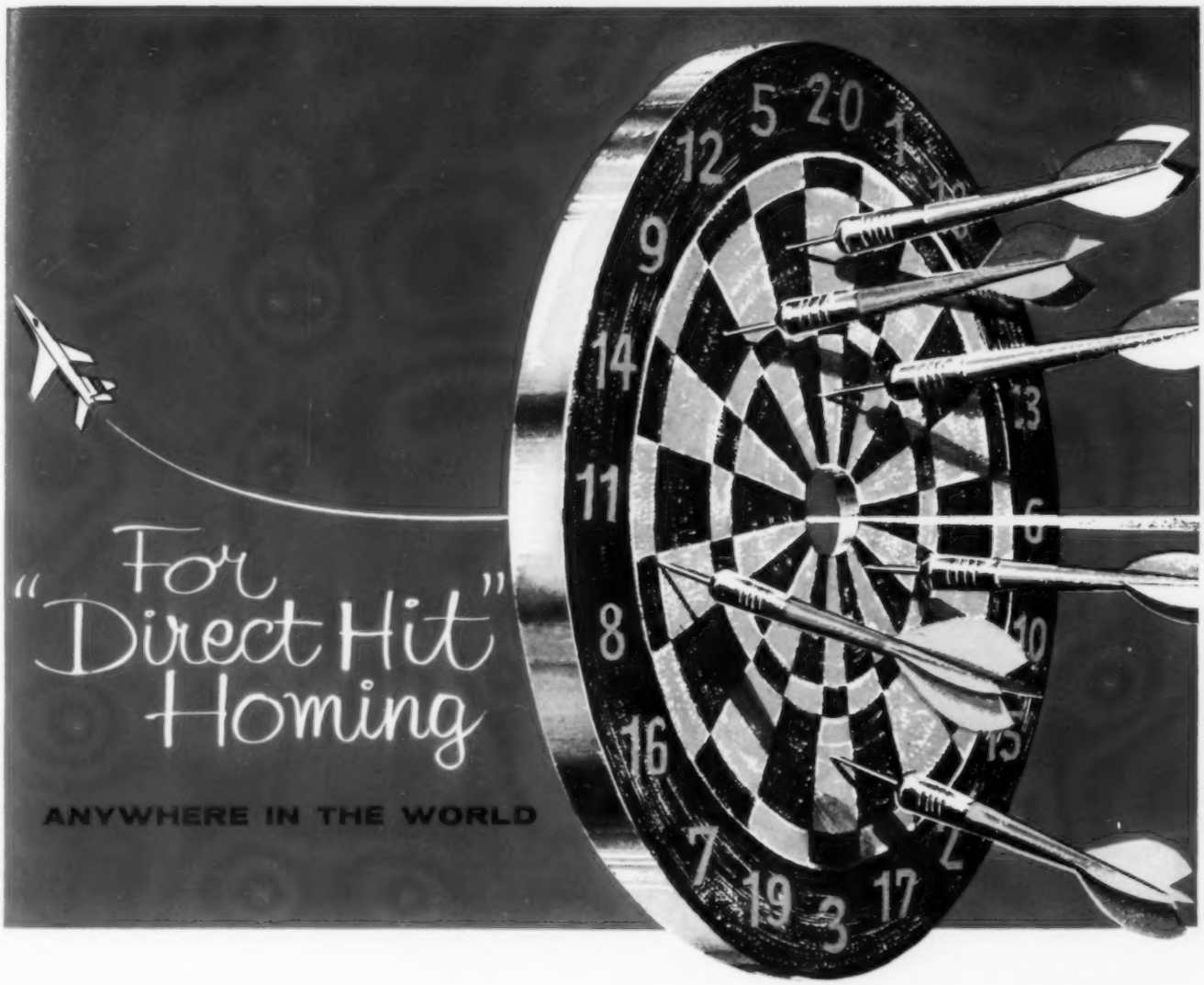

ARC'S TYPE 21A AUTOMATIC DIRECTION FINDER

TYPE 21A ADF WEIGHS ONLY 19.7 POUNDS
Component Unit Weights: Receiver, 6.8 lbs.; Loop, 4.3 lbs.; Loop Housing, 0.5 lbs.; Indicator, 1.3 lbs.; Control Unit, 1.6 lbs.; Power Unit, 5.2 lbs.;

As every pilot knows, a reliable ADF is still a basic and useful navigation aid. Throughout the world there are some 60,000 transmitters that offer pin-point guidance, over land and sea.

ARC's Type 21A ADF can be depended upon for precision homing under long-continued use in humid tropics, frigid northlands or burning deserts. It is one of ARC's outstanding contributions to air navigation. Its low weight (less than 20 pounds) and compactness make dual installations practicable even in light twins. If you plan to modernize existing equipment or are purchasing a new aircraft, specify the Type 21A for a long term investment in air safety.

Ask your ARC dealer for a quotation on this and any of the other ARC equipment listed below.

CAA Certificate No. 1R4-9 U.S. Military: AN/ARN-59 British Certificate of Approval VC-78

Aircraft Radio Corporation BOONTON, N. J.

Dependable Airborne Electronic Equipment Since 1928

OMNI/LOC RECEIVERS • MINIATURIZED AUTOMATIC DIRECTION FINDERS • COURSE DIRECTORS • LF RECEIVERS AND LOOP DIRECTION FINDERS
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30 YEARS OF ACHIEVEMENT IN AIRBORNE ELECTRONICS 1928 ARC 1958

IT SURE PROVES SOMETHING . . .

"Things are really on the move down at Aero Design's at Bethany . . . What's got the place really jumping is the backlog which has suddenly piled up on 500's. This is the first time an aircraft manufacturer ever reduced power in an airplane and got a favorable reaction . . . It sure proves something about a price fence in the twin-engine field . . . "

Leighton Collins
AIR FACTS, December, 1958

IT PROVES THAT A FULL-SIZED BUSINESS TWIN AT $64,750 MEETS A REAL NEED! ***AERO COMMANDER***

Look at maximum quality and economy and choose Aero Commander 500!

...the big-enough business twin at the lowest cost per pound of useful load!

THE AERO COMMANDER 500 provides multi-seat capacity in 177 cubic feet of cabin space, 1,100-mile-range, 200-plus mph cruising speed and a service ceiling above 21,000 feet. And the 500 features a useful load capacity of 2,100 lbs.—290 lbs. *more than "Plane C"*— 680 lbs. *more than "Plane B!"*

Yet this big, capable aircraft actually *costs less per pound of useful load* than either of its two nearest competitors!

All of the world-famous AERO COMMANDER characteristics are inherent in the 500: Unparalleled, high-wing stability; instant, easy response to controls; outstanding single-engine performance and maximum short-field flexibility!

Why settle for less than the finest when you can have this unequalled combination of superiority and economy? See your AERO COMMANDER distributor today!

WRITE TODAY FOR AN ILLUSTRATED BROCHURE!

AERO COMMANDER

AERO DESIGN & ENGINEERING CO
BETHANY, OKLAHOMA
Subsidiary of ROCKWELL-STANDARD Corporation

AERO COMMANDER 500

The Finest Combination of Greater

SPACE
CAPACITY
RANGE
STABILITY
VERSATILITY
ECONOMY

Mitchell Transistorization Makes Automatic Pilot Practical for Small Planes As Well as Large

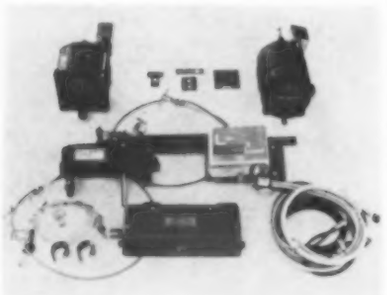
Now — with the transistorized Mitchell — even small single engine and light twin-engine aircraft can have the precision performance of an electronic automatic pilot of the most advanced design.

Utilizing rugged, button-size transistors instead of larger, more fragile vacuum tubes, the Mitchell Automatic Pilot weighs only 8.2 pounds and fits neatly between the instrument panel and the firewall. Under normal operating conditions, the unit pulls only 1/10 of an ampere from the 12-volt line; under very rough air conditions, it never draws more than one ampere — less power than is used by the average aircraft panel lighting system.

The complete installation can be made quickly and inexpensively with no soldering or complicated wiring . . . and *without* ripping into upholstery, running plumbing, or installing bulky components in cabin or fuselage. Also, the Mitchell Automatic Pilot can be easily removed in case the owner trades off his plane and wishes to keep the autopilot.

In manufacturing the unit, Mitchell maintains exacting quality standard and can therefor offer an unconditional one-year guarantee on the unit (exclusive of gyro instruments). The transistorized amplifier, for example, weighs only 2 pounds; yet all amplifier circuits are stitch-wired on glass fibre board with no printed circuits or paper condensers used.

The final proof of this new concept in automatic pilots, of course, is in actual performance. In flight, the Mitchell makes precision turns or holds a heading with a perfection possible only with extremely sensitive electronic equipment. The Mitchell senses and instantly responds to changes in attitude that could not be detected manually. *If you would like to arrange an in-the-air demonstration of the* Mitchell Automatic Pilot, *call your nearest dealer. Or write to one of the distributors listed at the bottom of this page.*



Including the gyro instruments, here are all components and parts of the transistorized Mitchell Automatic Pilot. The three basic units are the amplifier, the roll servo, and the pitch servo. No dynamoter, vibrator, vacuum tubes, or relays are required — substantially reducing weight, initial cost, installation cost, and maintenance problems.

POSITIVE THREE-DIRECTIONAL CONTROL

MITCHELL

ALL-TRANSISTOR AUTOMATIC PILOT

Small and compact, the all-transistorized Mitchell brings a new realm of precision automatic flight control to private flying. With a Mitchell Automatic Pilot installed in your aircraft, you can make smooth precise turns . . . establish precision climbs or let-downs . . . or fly a selected heading within one degree indefinitely . . . all completely "hands off." And the Mitchell Automatic Pilot is simple and inexpensive to install . . . normally uses less power than your instrument lights. Yet the Mitchell is amazingly low in price ($2425 for the 12-volt unit; $2625 for the 28-volt unit). Let your Mitchell dealer show you how you can get superior performance for less cost with a Mitchell Automatic Pilot.

APPROVED FOR MORE SINGLE ENGINE AND LIGHT TWINS THAN ANY OTHER AUTOMATIC PILOT

PIPER
APACHE
COMANCHE
TRI-PACER

BEECHCRAFT
BONANZA
TWIN BONANZA

CESSNA
172-175-180-182-310
SKYLANE

MOONEY
MARK 20
MARK 20A

NAVION
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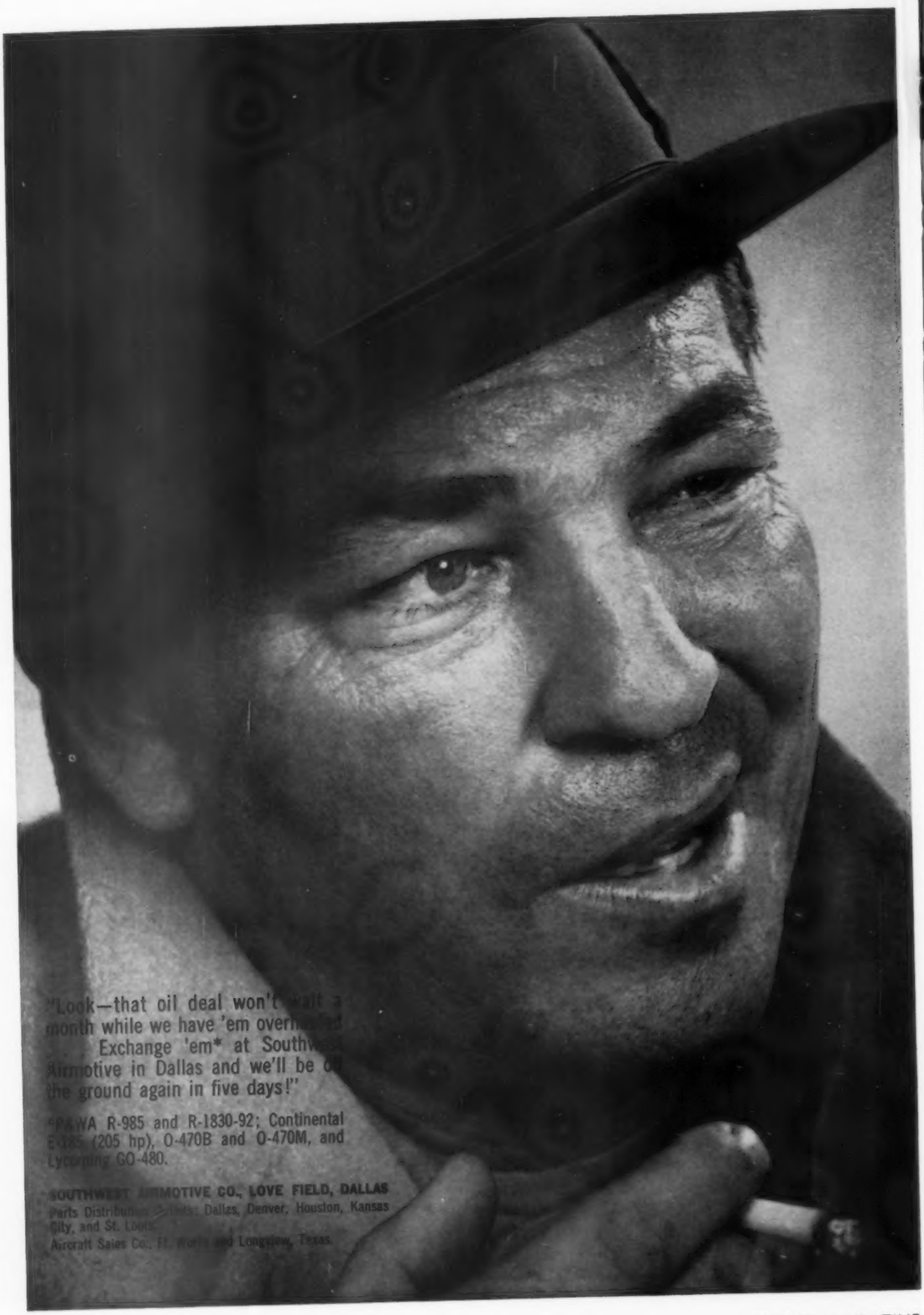
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Just among ourselves

Woe, the Weary Controller!

TOO often in this business the people who have the most intimate knowledge of a subject are the last to be heard. In our opinion the people who know most about our current air traffic control problems are those veteran air traffic controllers who have wrestled with it for years, sweating it out in the tower as the pilot sweats it out in the cockpit.

We asked for and received permission to reprint here a well-written piece on some of the present problems. The author is controller Herbert C. Spiselman of the New York International Airport tower and his opinions originally appeared in the January isue of the *Journal of Air Traffic Control*, official publication of the recently formed Air Traffic Control Association, 2319 M Street, N. W., Washington, D. C. Here's the article in full:

Recently a massive amount of energy has been exerted by prominent individuals connected with air traffic control to produce traffic control systems which will alleviate modern-day problems. The lamentable mid-air collisions which have taken place within the last two years have served to spur this endeavor almost to a frenzy.

Several of the proposals which have been advanced are extremely scholarly works. One, published recently, replete with three-dimensional drawings, was very scholarly indeed. As a matter of fact, despite a college degree, graduate work in law and education, and more than 15 years in aviation, it took this writer five readings to derive a modicum of understanding of the proposed system. However, the proponent of this system put much time and energy into its derivation and should be highly praised for his work.

These various proposals show us how, with or without radar, we can expedite traffic and pack more and more aircraft into a terminal area. Let's pour them in, boys! No holding at the approach fixes—we'll sequence them 90 miles out, etc. All this frenzy, about moving traffic, has blocked and clouded the true issue—*Safety!*

Let us not forget that the FAA was born in a desire for safety. Let us not forget that the attention of Congress was, and is, focused on safety. Let us not forget that if we ignore safety we are betraying the trust that has been vested in us. Let us not confuse safety and expediting. They are not always one and the same. Here is why:

1. Consider the schemes which propose a steady flow of traffic into the terminal area with no holding at the approach fix. What happens if 10 aircraft estimate the terminal at the same time? They have to be held and sequenced some place, unless, of course, the airport has 10 landing runways that can be utilized at the same time. So where do they hold? If not at the approach fix, they must be held enroute, thereby blocking altitudes for enroute aircraft. Is this safe procedure? Is this what we need in the first place? There isn't a controller worth his salt at any high density radar approach control airport who cannot maintain a constant sequence from the approach fix with any given distance interval, give or take a mile. This is not the problem. What do you do with the aircraft that are left over? What happens to the 10 or 15 aircraft leaving the 10 or 15 different airports all bent on arriving at the same place at the same time? Somebody has to wait! No manner of expediting scheme is going to solve this problem. This calls for forebearance and common sense—not complicated schemes that leave us with the same number of feet all trying to get into the same shoe.

2. The heart of safety at a high density airport is coordination between the local controller and the departure and approach controllers. When approach control was moved from the center to the terminal airport, where it belongs, the aircraft that missed approach, the pilots who found themselves in unusual situations not covered by the book, and the flight experiencing an emergency condition—all found themselves with a better chance of survival because approach control, departure control, and local control were housed in the same facility, thereby making coordination that much easier. Of all the areas where coordination is necessary, this is the most vital. The proposal which promulgates a physical separation of these units is sacrificing safety for a questionable gain in expediting. At this point we should, perhaps, restate our mission; i. e., "Safe, orderly, and expeditious movement of air traffic." Please take note of the order of importance of these factors. It is trite, perhaps, but it is incisive—and no amount of sophistication can change its importance.

3. The systems that propose a separate physical location for, or consolidation of, approach and departure control are neglecting to consider the problem of personnel training. The FAA is suffering from a dire lack of experienced personnel, and there is no indication that the new controller 10 years from now will have any more experience than those of today. It is also clear that the local controller at a high density airport must be thoroughly familiar with the functions and duties of approach and departure control; and they, in turn, must be familiar with the local controllers' problems. Any change in this procedure is tantamount to sacrificing safety for alleged expediting.

4. Most of the proposed systems fail to take into consideration the problem of the pilot who departs VFR and suddenly, upon entering the terminal area, finds his position untenable, either because he cannot maintain VFR, or because the conditions are so marginal as to be unsafe. He calls upon approach control to "squeeze him in," thereby diverting the controller's attention from a steady stream of IFR traffic (especially in the instance of an expedited flow proposed by most of these new systems). The statement that they shouldn't be there in the first place is no answer. He is; they are; and only more stringent regulations will

alleviate the condition.

5. Most proposed systems to date refuse to accept the realities of common arithmetic before going into higher mathematics. For some reason we are loath to place some of the blame for delays where it belongs; on the shoulders of the airlines. Because of a half-hearted, unsuccessful trial, several years ago, of coordination of scheduled flights, we are unwilling to place the square peg in the square hole. As soon as it is mentioned that the airlines ought to coordinate their flights so that everyone is not going to the same place at the same time, a howl of indignation goes up. But the fact remains that unless the plum of the peak hours is shared, somebody is going to get hurt. If a passenger finds that he cannot get a flight at the exact time he wants, he will have to settle for the next best. This is certainly preferable to the chance of his not getting to his destination at all. We can build the largest highways in the world, but if everyone wants to go to the same place at the same time, there is going to be a traffic jam, whether it be in the air or on the ground. By all means let us have the best highways we can, but, by the same token, let us realize their limitations.

There is no doubt that some good will come of these various proposals in the form of better procedures, but let us remember there are limitations to any system, and, what is more important, there are limitations to what the controller can handle in the way of traffic. Most of the proposed systems will only tend to place more of a load on his already overburdened shoulders.

It would be a poor critique indeed that did not offer some constructive proposals. The following are not meant to be as intensive as the learned proposals heretofore mentioned, but they might aid in a solution of the immediate problems of control. In simplicity there is safety.

1. Installation of radar approach and departure control at as many terminal facilities as possible—and full use thereof, including the joining of adjacent towers into a low altitude control area. This is an already proven way of taking the load off the enroute center and expediting traffic safely.

2. Proper planning of airports; i. e., parallel runways, high speed turnoffs, proper planning of facilities, etc. The difficulty of trying to get Size Ten traffic into a Size Two airport is self-evident.

3. More stringent regulations concerning VFR aircraft entering a crowded terminal area under marginal conditions. At the present time a "75-mile NOTAM"; i. e., a "Notice to Airmen" that requests all aircraft entering a terminal area to obtain an IFR clearance prior to arriving within 75 miles of it, is merely a request and must be strengthened.

4. Face realities. Everybody cannot go to the same place at the same time. Schedules must be controlled. If the airlines cannot do it themselves, an agency that can should be commissioned.

I realize that I will incur the wrath of many people, whom I admire and respect, from the thoughtful men who are attempting to devise a more efficient system of air traffic control to the airline operators who are trying to make a thoroughly deserved profit. For this I apologize—but someone has to stand up and shout, "Tilt." We are bending our efforts the wrong way.

We need clear thinking and decisive action and we need it now; otherwise woe, the weary controller. He will have to continue to struggle to keep his nose above the water.

Welcome Road Builders

WE recently attended a meeting of the American Road Builders Association and found to our pleasant surprise that they have a well organized and hard working committee on airports. Tom Jordan, director of aviation for the State of Wisconsin, heads up the committee.

If we are ever to have a national system of small airports it's now apparent the road builders are one of the logical agencies to get the program off the ground. It is also clear that we will never accomplish much more than surface scratching if we depend on the Federal Airport Program, which has always been tied to towns and cities that insist on having airports on an elaborate scale.

Billions of dollars will be spent in the next few years on the nation's highway system. What would be more logical than to incorporate a flight strip program into our highway program? This thesis has been expounded for a quarter of a century. However, and unfortunately, it has never gotten out of the talking stage. Perhaps now with the road builders interested the aviation industry and consumer groups will get on the bandwagon and come up with a practical formula with or without the assistance of the Federal aviation planners.

The job is a big one because it includes land acquisition, engineering, construction and maintenance. If tied into the super highway program the project would be truly national in scope, the strips would be permanent and the savings from simultaneous development would be fantastic compared with a scattered-shot, separate airport program.

Despite the handwriting on the wall, which plainly indicates a slowing down of general aviation development if we don't come up with a small airport program, civil aviation leadership continues to dodge the issue. Now that the road builders are initiating action maybe they can wake up the people who will profit the most from such a program.

Friends At State Level

AIRMEN in many states can look for a concerted effort to either curtail or completely abolish their state aviation agency during the current year. This negative pressure has been building up during the past couple of years and will probably reach its peak in 1959 due to the financial plight most states find themselves in, the assumption that the new Federal Aviation Agency is a cure-all and that state functions are duplication of the Federal functions.

In those states where the gasoline tax is retained by the state, sometimes for support of the state aeronautics commission, the scheduled airlines are the chief adversary.

It would be wise for all airmen to keep informed in such matters at the state level. In most states the aeronautics commission is the best friend aviation has — a protector and a developer. In many states it's very obvious that most aviation progress has derived from intelligent state aviation laws administered by dedicated aviation leadership. While this is not universally true it certainly offers convincing proof that total power in Washington is not the answer to a healthy climate for aviation development.

According to the National Association of State Aviation Officials, the most critical situations will exist in the following states: Illinois, Michigan, California, Alabama, Wisconsin, Tennessee, Florida, Texas, Minnesota, Massachusetts and Pennsylvania with some agitation expected in others.

What is the situation in your state?

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Fly it and see why it's America's most popular 5-to-7 place business plane

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But there's more, much more, waiting for you to discover at the controls of the Twin-Bonanza. See your Beechcraft distributor or dealer soon. Be sure to ask about low-cost Beech financing and leasing plans. Or write to Public Relations Dept., Beech Aircraft Corp., Wichita 1, Kansas, U. S. A.

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"You're right! The Super 18 flies more like an airliner than any business plane I've ever flown!"

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4. Separate pilot compartment with big, comfortable airliner-type seats.

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6. Airliner-type passenger lounge in which your firm's top men feel "at home," with private lavatory, food bar, office-aloft equipment and lots of "walk-around" room.

Fly the Super 18 this month. Find out what you're missing! Find out, too, about low-cost Beech financing and leasing plans. Ask your Beechcraft distributor or dealer. Or write Public Relations Dept., Beech Aircraft Corp., Wichita 1, Kansas, U. S. A.

SUPER 18 TWIN-BONANZA BONANZA TRAVEL AIR MS-760

Beechcraft

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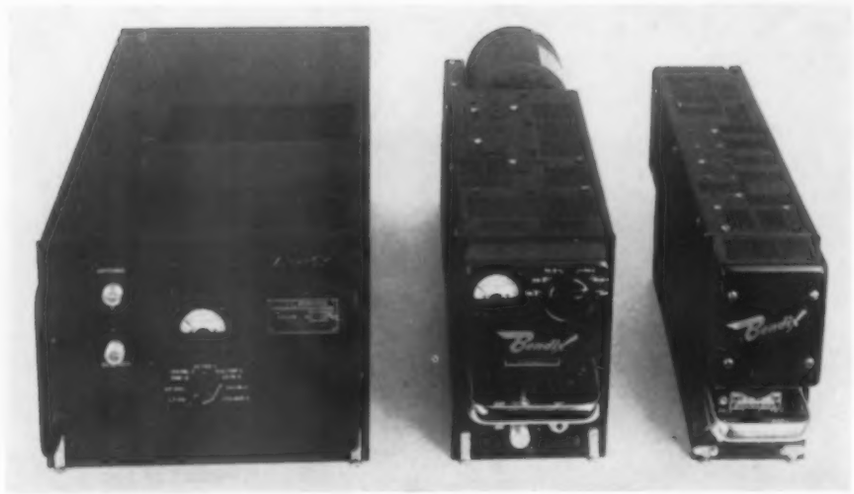


Better But Smaller

Bendix achievement in scaling down space, weight and power requirements for top-quality aircraft radio is illustrated by picture of VHF transmitters showing TA-18 at left, TA-20 at center and TA-21 at right. Sharp reduction in size, weight and power consumption is shown by following comparisonss

	1951-58 Model TA-18	1955-58 Model TA-20	1958-59 Model TA-21
Output, Min. Watts	25	25	25
Rack Size	1 ATR	½ ATR	⅜ ATR
Package, Cu. Ins.	1510	715	400
Weight, Lbs.	45	27.5	14
Power Cons., Watts	415	345	150

Bendix Moves Into Light Twins

By GEORGE E. HADDAWAY

BIG news up Baltimore way is the broadened line of Bendex aviation radio equipment for the commercial market, especially in the booming light-twin bailiwick. It's a logical move on the part of Bendix in view of the more than $50,000,000 worth of new light twins sold in 1958 and every indication is that this figure will continue to rise consistently in the foreseeable future.

Long known and recognized as a principal supplier of superb electronics equipment to the airlines, the military and the corporate air transport users, Bendix Radio is taking advantage of the rapid advancements in radio and electronic engineering which permit tremendous weight and size reductions together with improved reliability, all due to the use of transistors and of revolutionary new circuitry, including the use of printed inductances and wiring. The 1959 line reflects reductions in size and weight from one-half to two-thirds of the predecessor equipments and an appreciable reduction of input power requirements to operate them. Hence the considerably broadened market potential.

But there's far more than just tech-

New Bendix units in Cessna 310 panel are pictured below, showing new easy-reading crystal-controlled tuning heads at left, selector switches at center, ADF head with digital tuning at right and Omni-Mag and RMI instrumentation on flight panel. This installation includes VHF communications, dual omni-localizer systems and ADF.

—(Bendix Photo.)

One of several new Bendix tuning heads, the CNA-21C features digital presentation in large numbers, with knob at left for whole megacycles and one at right for fractions and smaller knob on it for on-off and volume. Three smaller insets are lights. Switch for single-channel or double channel selection. This panel provides simultaneous control of both receiver and transmitter. Panel dimensions are 5.75 ins. by 1.9 ins.

nical progress going on at Bendix in Baltimore. Even the most casual visitor to the plant will catch the new spirit of aggressiveness now that they are biting off a larger part of the potential market for commercial products. Apparently Bendix top management has decided to go "whole-hog" instead of just part way in the booming commercial aviation field. They have separated the commercial division from the military division and put them "on their own". They have complete autonomy in development, in manufacturing and in marketing.

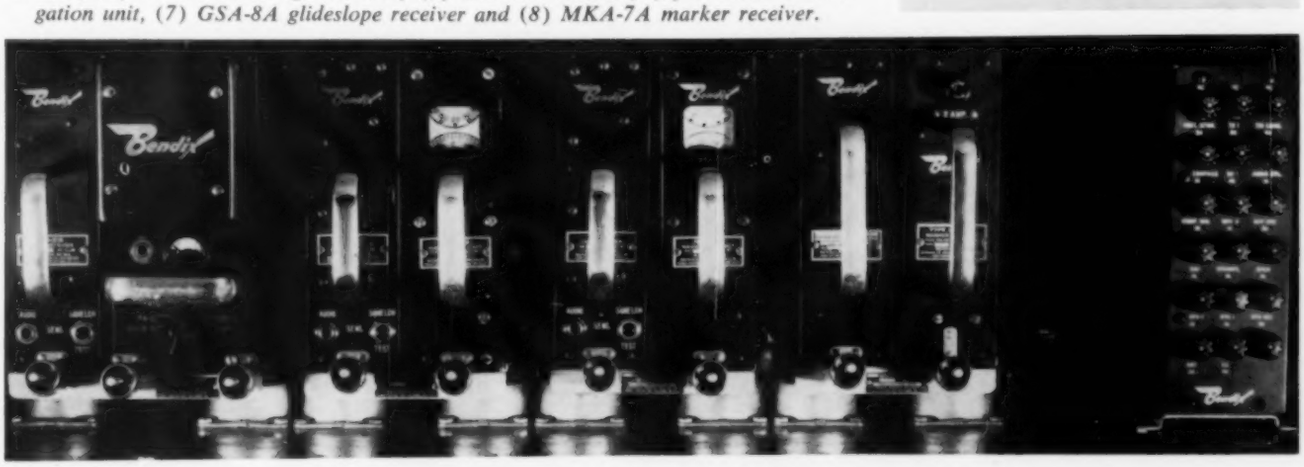
This organizational change has had a healthy effect on everybody concerned. It has stimulated the employeees and executives alike because they feel they not only have their own shop but can open up new opportunities in direct proportion to commercial aviation radio requirements and market development. The very apparent new atmosphere around the shop will in all probability show up in the one place it pays off—increased sales volume.

While Bendix is bringing out constantly improved big airplane equipments, including weather tracking radar, there's no doubt but that the hot items at Bendix in '59 will be the new advanced "21" series which includes the TA-21A VHF transmitter, the RA-21A VHF receiver and the NVA-21A navigation unit. The 360-channel transmitter boasts 50-kc spacing, 25-watt R-F output, printed circuits and transistorization in the audio/modulator section. Frequency range is 118.0 to 135.95 megacycles and weight with d-c power supply is only 14 pounds. The TA-21A is housed in a short 3/8-ATR case.

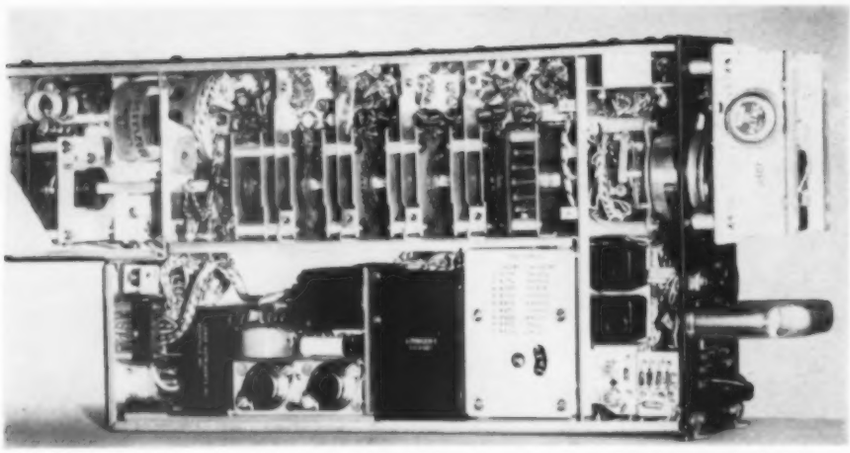
This unit is designed as a companion piece for the RA-21A VHF communications receiver with 560 channels and 50-kc spacing. Built in accordance with ARINC electrical specifications for airline use, the receiver weighs but 8.2 pounds with DC power supply and is completely self-contained in a short 1/4-ATR package. It may be used alone as a communications receiver (108.0 to 135.95 megacycles) or in conjunction with the NVA-21A Navigation unit to provide VOR/NVA-course information (108.0 to 117.9 megacycles).

The NVA-21A is fully transistorized and weighs only 9.25 pounds. It provides localizer, complete automatic VOR and is packaged in a short 1/4-ATR case. Optional plug-in radio magnetic indicator amplifier for complete automatic instrumentation is available. Facilities provided are: 90/150-cycle tone localizer operation; manual omni-range presented on the vertical needles of an FPDI with associated course selector and flag alarm

New Bendix GMA-71B goniometer (above) provides ADF indication and contains all moving parts of the new Bendix LPA-71 fixed-loop ADF antenna (below). Goniometer weighs 2.9 lbs., loop 1.9 lbs. Loop is less than one inch thick.



Here's a lot of airline-standard lightweight Bendix gear in a small space in a Cessna 310. Left to right are (1) RA-21A receiver, (2) TA-21A transmitter, (3) RA-21A receiver, (4) NVA-21A navigation unit, (5) RA-21A receiver, (6) NVA-21A navigation unit, (7) GSA-8A glideslope receiver and (8) MKA-7A marker receiver.



New Bendix TA-21A VHF transmitter's compactness and internal accessibility are shown in this side view with cover removed. Tuning mechanism in center uses printed inductances for precise tuning. TSO'ed, TA-21A provides 360 crystal-controlled channels, 118.0 to 135.95 mc; 25-watt output; is housed in short 3/8-ATR case including either ac or dc power supply. It weighs 14 lbs. with dc supply, 15.8 lbs. with ac supply. Unit has seven tubes and ten transistors.

to give lateral flight path information; automatic omni-range presented on dual-pointer, heading-sensitive azimuth indicator which may be connected to provide simultaneous dual VOR bearings or simultaneous VOR and ADF information. Voice identification signals are obtained directly from the companion RA-21A VHF receiver.

Bendix is also offering a new glideslope receiver and a new marker beacon receiver. The GSA-8A glideslope receiver is a 20-channel UHF unit receiving 90/150-cycle, tone-modulated glideslope signals on ILS. The output of the receiver is used to operate the horizontal pointer of any standard flight path deviation indicator. In use with the RA-21A VHF receiver and the NVA-21A navigation unit package, it completes the ILS requirements as to receiving facilities. Both receivers may be operated simultaneously from a single-frequency control panel. With transistorized power supply, total weight is only 7.8 pounds. The GSA-8A is housed in a short 1/4-ATR case.

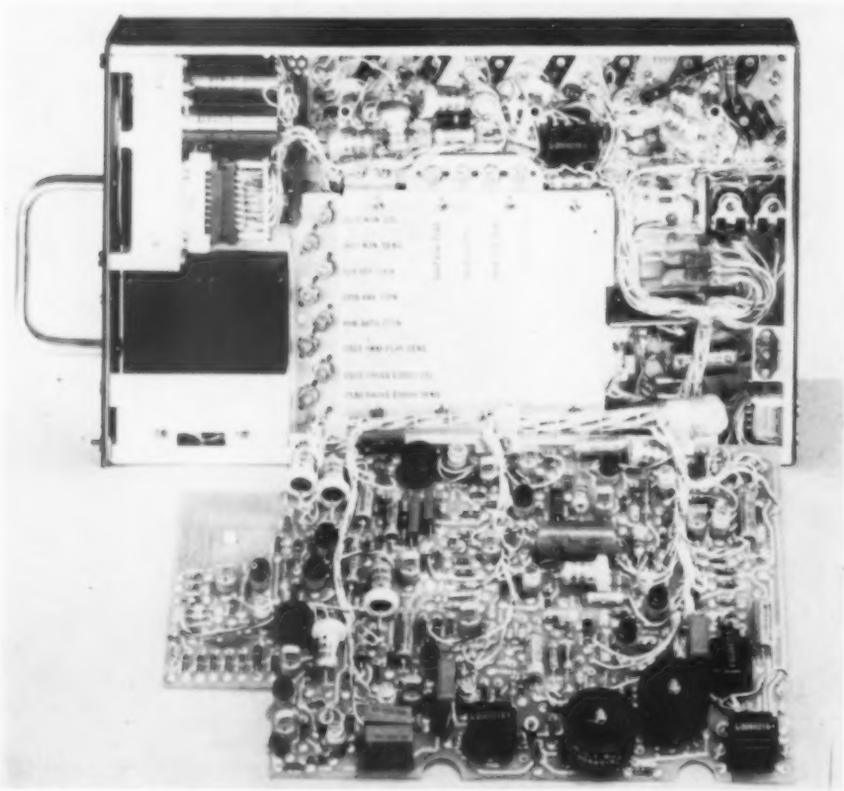
The MKA-7A marker receiver is a compact, single-channel navigation receiver designed for reception of marker beacon signals emitted from airway and approach markers. Also packaged in a single ¼ ATR form factor case, it weighs 8.5 pounds with power supply. TV and FM interference will not produce erroneous lamp indications on the standard blue, amber and white panel lamps.

More current is a fully-transistorized marker receiver housed in a "piggy-back" case that's 1/4-ATR and only half the standard height which allows dual mounting on one 1/4-ATR rack. It weighs approximately 2.5 pounds and will eventually replace the MKA-7A marker receiver. Also being produced is a "piggy-back" manual nav unit.

Improved performance and significant reduction in weight and size also highlight the DFA-70 Automatic Direction Finder System which is so well known throughout the military, airline and executive aircraft world. Bendix has spent considerable sums of money in antenna research and it has paid fruitful dividends, especially in a new fixed-loop ADF antenna to be marketed this year. Less than one inch thick, the LPA-71 antenna can be mounted outside the skin of the aircraft either top or bottom without the need of fairings or cavities. This no-drag type of mounting requires no extensive cut-out as the only opening needed is a hole large enough for the connector. It contains no moving parts since all mechanical components are in the goniometer, far removed from the severe environment found in aircraft skin. Antenna and goniometer together weigh less than five pounds.

No discussion of Bendix Radio progress would be complete without mention of their airborne weather radar system—the RDR-1D. Bendix pioneered this development which is paying dividends to hundreds of users in avoiding violent weather, in saving on fuel and time and in maintaining flight schedules.

The big news in the radar depart-



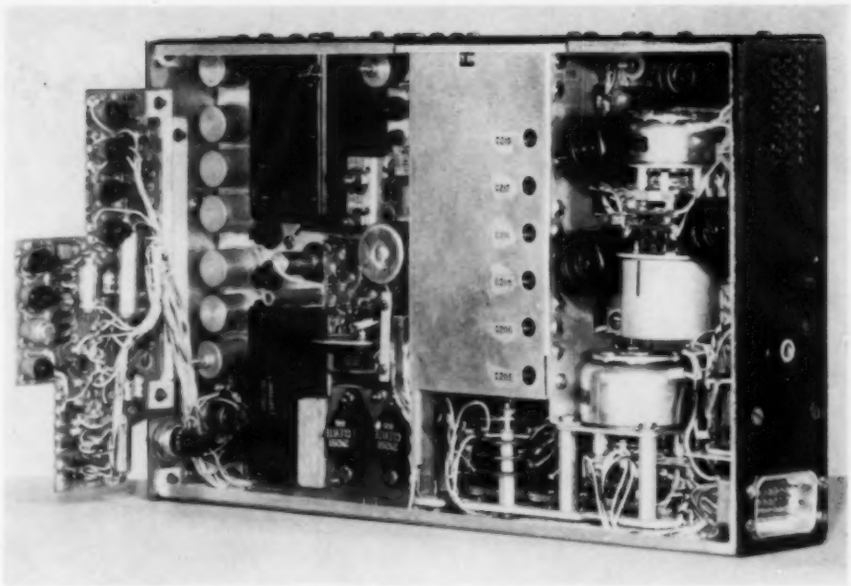
New Bendix NVA-21A Navigation Unit, used with RA-21A VHF receiver, operates localizer and automatic VOR instruments. TSO'ed, it is completely transistorized and its printed wiring and miniature (pygmy size) synchro resolvers result in reduced size and weight, considerable reduction in power required and improved reliability. Main chassis is mounted vertically with transistors and service adjustments on one side and all point-to-point wiring on other. Printed wiring board is hinged to chassis and is shown opened out for inspection. It contains smaller components such as resistors and capacitors. NVA-21A is in short 1/4-ATR case, weighs only 9.25 lbs.
—(Bendix Photo.)

ment is the recent installation of a complete system in a twin Beech. Weighing approximately 90 pounds, this original installation foreshadows a broadening market for airborne radar in the years to come. Who would have thought a couple of years ago, seeing weather radar systems being installed in Connies and DC-7's, that a similar system would some day go into a twin Beech? So rapid is the progress in electronics we have come to believe most anything is possible. Bendix officials say its new advanced design RDR-1 airborne radar system is the lightest and smallest 150-mile system on the market. The entire complement of electronic rack-mounted equipment consists of only two units, each one-half ATR size. Over 300 radar units are now in use by executive owners.

Back in the experimental department we saw a tremendous amount of work going on in Doppler Radar, in DMET and in the field of transponders. We confidently predict the new year will bring some definite accomplishments in each of these most important areas of aviation electronics.

As mentioned previously the Bendix engineers have gone all-out in the use of transistors, new circuitry and modularization in every instance where each of these developments pays off. Bendix is using transistors at the rate of one million annually. Conventional tubes are still used where they serve better than transistors.

(Continued on page 48)



New Bendix RA-21A VHF receiver provides 560 crystal-controlled channels from 108.0 to 135.95 megacycles and communications and for navigation. TSO'ed, its short 1/4-ATR case includes either ac or dc power supply, with weight of only 8 to 8.2 lbs. It uses four tubes and 23 transistors. The Bendix PSA-21A ac power supply operates from 115-v, 300 to 1,000-cycle primary power source and incorporates silicon rectifiers. The Bendix PSA-21B dc power supply is a transistorized oscillator power supply which has no moving parts.

—(Bendix Photo.)

The Bendix Cessna 310 (right) and a Bendix Beech 18 with radar will soon be demonstrating the new Bendix equipment all over the country. Hersh Wolf (left), Clarence Rice (center) and George Church of Bendix are shown below (right) with an engineering model of the new 1/8-ATR manual VOR/LOC unit to be produced next fall. Below, left to right, are Bill Abshire, Curly Aldrich and Chuck McAtee of Bendix, who flew 100,000 miles contacting dealers and business pilots last year.

—(Bendix Photo.)

With two Junior Jatos firing, Beech Super 18 gains 500-fpm. additional rate of climb at gross weight and with one or both primary engines operating.

—(Beech Photo.)

Junior Jato For Twin Beech

STANDBY auxiliary rocket power for emergency needs is now offered by Beech Aircraft Corporation as optional equipment on the twin-engine Beech Super 18 and will be offered in kit form for installation in the field. Beech last month announced the development as the world's first approved commercial application of standby rocket power in business aircraft grossing less than 10,000 lbs. in weight.

The Beech package utilizes two rockets, one installed in the afterbody of each engine nacelle atop the wing. These are the new Aerojet-General Junior Jatos, known as the Model 15NS-250. Each Junior Jato is rated for 250 lbs. of thrust, thus giving the twin installation a total of 500 lbs. of available standby thrust, and each rocket has a firing duration of 15 seconds.

Thrust of the Junior Jato is the equivalent to about 100 hp. at normal climb speeds, the effect of the Beech installation being to give the aircraft a total of about 200 hp. for both units. Each rocket weighs 42 lbs. but the installation weight is 50 lbs. each for a total of 100 lbs. Beech explains, however, that the performance gains are "at least 10 times as great as the performance increase required by the additional weight."

The Junior Jato has a standby carriage life of 500 flight hours or one year, whichever occurs first, and is replaced if not used during that per-

Solid-propellant Junior Jato is shown below at left being loaded into nacelle afterbody fixture, pictured at right with cover leaving small exhaust nozzle for rocket. Junior Jato installation weighs 100 lbs., costs $2,960 and replacement rockets cost $375 each.

—(Beech Photos.)

Control panel for Junior Jatos on Beech Super 18 is installed above windshield and has arming and firing switches at left, with circuit testing controls and two lights at right which show when Jatos are armed.

—(Beech Photo.)

iod. Replacement costs $375 per rocket. Solid propellant is used and the entire unit is replaced. The customary operation is to fire unexpended rockets for pilot familiarization near the end of the life period and then make the replacement.

Beech has priced its optional installation at $2,960 for the equipment. No price has been announced for field kits, which are still being engineered.

The use of standby rocket auxiliary power has become widespread in commercial aviation among corporate operators of Lockheed Lodestars, Douglas DC-3's and other transports larger than the Beech Super 18. These aircraft use Aerojet-General's larger 15KS-1000-Al Jato, rated at 1,000 lbs. of thrust. Commercial and military aircraft have used over 100,000 of the 1,000-lb. units with impressive success.

Standby rocket power for small twins did not become available until Aerojet brought out its Junior Jato rocket and its use is expected to become more widespread than that of the larger unit. Beech is first with the standby power for its Super 18. Next on the list will be an approved installation for Beech Twin-Bonanzas, with other makes of small twins following.

The cost is worthwhile because standby rocket power provides additional safety factors, especially in engine-out emergencies. These rockets develop their full thrust instantaneously when fired. The effect is to reduce propeller loads so that the remaining operative engine develops its full power more quickly. The emergency-handicapped pilot is thus enabled to increase his climb speed, clear obstacles in his flight path, recover from undershooting or to complete go-arounds which might not be possible without standby rocket power. These conditions can arise even with both engines in operation and the availability of excess power from the rockets is just as valuable under these circumstances.

Immediately after Beech announced the Junior Jato installation for Super 18's, eight orders specified the installation. As more owners of the Super 18 become aware of the availability, standby rocket installations will be ordered in large numbers.

At full gross weight for a Super 18, with one or both its 450-hp. engines operating and at 100 mph. as in a climb, firing of both Junior Jatos will add 500 feet per minute to the rate of climb, according to Beech. This is for a duration of 15 seconds, enabling the pilot to gain better than an additional 100 feet of altitude or add considerably to his climb or speed while performing emergency procedures in safety.

There is no altitude handicap on the thrust from the Junior Jatos—actually, they probably produce more thrust at higher elevations. Their solid propellant carries its own oxidizer and does not depend on oxygen in the atmosphere for combustion.

However, rocket power is affected by ambient air temperature. Beech expresses this effect as follows: Normally rated at 250 lbs. of thrust, the Junior Jato will deliver 195 lbs. of thrust at minus 65 degrees F., 260 lbs. of thrust at 60 degrees F., and 360 lbs. of thrust at 160 degrees F. (very high runway temperatures are experienced in tropical and desert areas). Duration of thrust also varies with temperature for the Junior Jato, being 19 seconds at minus 65 degrees F., 15 seconds at 60 degrees F., and 11 seconds a 160 degrees F.

The Beech installation, fully approved by the Federal Aviation Agency (CAA), includes an ignition control panel in the cockpit with which the pilot can test his firing circuit, arm the rockets and fire them by electric switch.

First Beech Super 18 equipped with factory Junior Jato installation is A. J. Wildhaber's Weyerhaeuser Timber Beech, shown with Wildhaber (right) and Beech Test Pilot Steve Tuttle, who conducted first flight tests.

—(Beech Photos.)

Redesigned nose and cowl are seen in this portrait of the 1959 Cessna Model 182. Lower cowling provides better streamlining around nosewheel strut. Air filter has been raised higher on nose cap for more protection against dust and dirt.

—(Cessna Photo.)

Cessna's Middle Line For 1959

MORE streamlining, a couple miles per hour more speed, new nose cowlings, new instrument panels and a new low-cost "automatic" flight system feature improvements in 1959 versions of Cessna Aircraft Company's medium-priced 4-place lightplanes introduced last month by its distributors and dealers. These are Models 180, 182 and Skylane, which Cessna promotes as its "mighty middle line" and which produced over 1,000 unit sales during 1958.

Prices are up slightly over 1958 for the three models, as follows: Skylane, $17,095, up from $16,850; Model 182, $14,600, up from $14,350; Model 180, $14,250, up from $13,850.

Performance is up, too, for the Skylane and 182 but remains unchanged for the 180. Skylane cruise speed is now 160 mph. and Model 182 cruise is 157 mph., both being 2 mph. faster

Cessna Model 180 remains unchanged in looks. Cessna has sold over 3,400 of the tailwheel 180's since the model was introduced. It is widely used as a work plane, in bush operations and on floats.

—(Cessna Photo.)

Deeper nose cowling gives new Skylane fatter look up front. Note new and larger cabin entry step on main gear strut. Skylane is top of Cessna's 4-place line and standard equipment includes Narco Omnigator at $17,095 price.

—(Cessna Photo.)

than 1958 models, while the Model 180 remains the same at 160 mph. These cruise speeds are factory figures for 70% power at 8,000 ft.

This slight improvement in speed pays off with increased cruising range at 70% power and 8,000 ft., on the same fuel capacity (65 gals. of which 55 gals. is useable) as last year, being 675 miles in 4.2 hrs. at 160 mph. for the Skylane, an increase of 8 miles with the same fuel and endurance but at last year's 158 mph.; and 660 miles in 4.2 hrs. at 157 mph. for the Model 182, up 5 miles with the same fuel and endurance but at last year's 155 mph. The Model 180's range remains the same at this power, being 675 miles in 4.2 hrs. at 160 mph. The increase in maximum range is even more for the Skylane and Model 182. At 10,000 ft., with no reserve and at 120 mph. for the Skylane and 118 mph. for the Model 182, the range is 845 miles in 7.1 hrs. for the Skylane, up from 819 miles in 7.1 hrs. in 1958, and 835 miles in 7.1 hrs. for the Model 182 as compared to 805 miles in 7.1 miles last year at 114 mph. Maximum range at 10,000 ft. without reserve is the same as last year for the Model 180, being 845 miles in 7.1 hrs. at 120 mph.

In effect, the improved streamlining has brought the tricycle Skylane up to the level of the tailwheel Model 180 in speed and range. When Cessna first added the nosewheel to create the 182, it was 5 mph. or more slower than the tailwheel 180. This speed difference has been eliminated for the Skylane and has been chopped down to only 3 mph. for the Model 182 with the 1959 models.

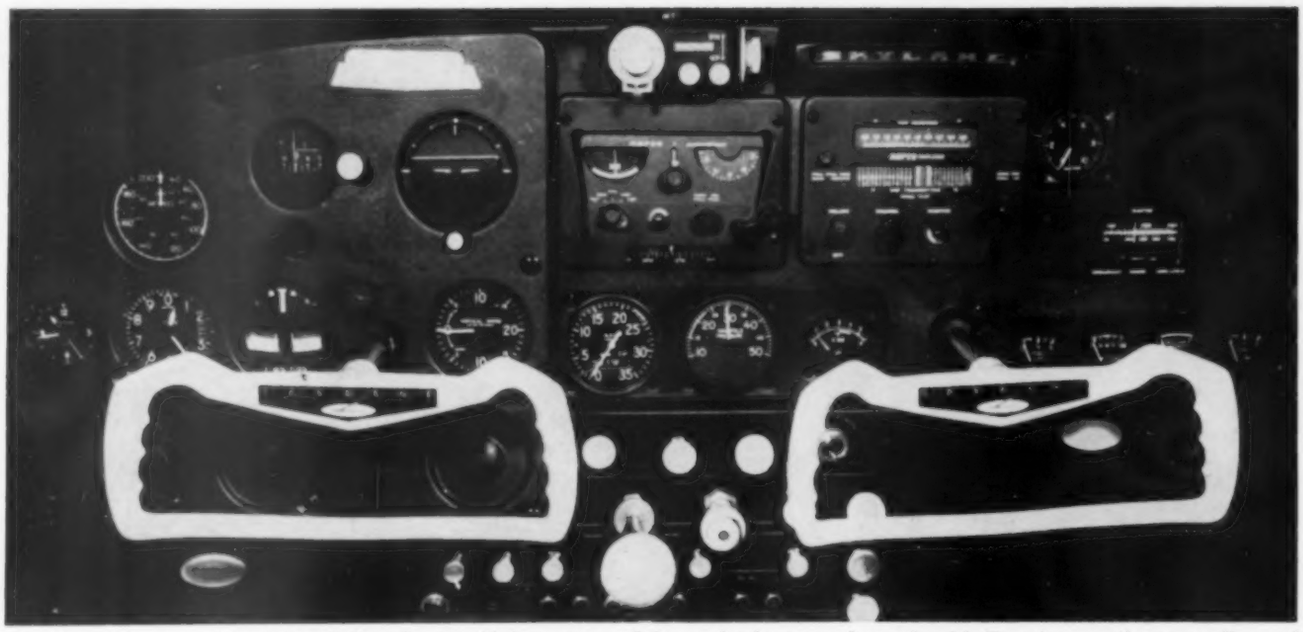
Of the three airplanes, however, the Model 180 still offers the best rate of climb, being 1,130 feet per minute as compared to 1,030 fpm. for the Skylane and Model 182, and the 180 has the lowest empty weight, giving it more useful load with all three models at the same 2,650-lb. gross weight. The 180's useful load is 1,124 lbs., the 182's is 1,107 lbs. and the Skylane's is 1,056, empty weights being 1,526 lbs. for the 180 (about 27 lbs. lighter than in 1958 because cross-

New Royalite fillets for wing strut attach points reduce aerodynamic drag and upper fillets incorporate larger retractable tie-down ring. Fillets are standard on Skylane.

—(Cessna Photo.)

New cowling is shown below with relocated carburetor air intake filter and adjustable cowl flaps on Model 182 and Skylane.

—(Cessna Photo.)



New instrument panel in 1959 Skylane locates flight group at left on shock-mounted panel, with Tactair autopilot controller and radios across top of center section and engine instruments below them. Engine controls and switches and circuit breakers are at bottom of center section. Oval knobs are for glove compartment at right and chart case at left.

—(Cessna Photo.)

wind gear is no longer standard and production efficiency saved 9 lbs.); 1,543 lbs. for the 182 and 1,594 lbs. for the Skylane (up 34 lbs. from 1958 because it includes speed fairings and instrumentation which were not included last year).

Complete factory data for all three versions are given in a tabulation accompanying this article.

Cessna has obtained more speed for the 182 and Skylane through the use of wing strut fillets at the wing strut attach points and from aerodynamic redesign of the forward fuselage area and nose cowling. The new nose cowling dips lower to provide a shorter nosewheel strut length for better fairing and a more streamlined nose cap. Complete redesign of the cowl provides an improved air filtering system, with the carburetor air filter moved higher in the nose cap for easier removal for servicing. The air induction system provides an adapter duct for diverting filtered air from the filter to the carburetor, this duct being an integral part of the lower cowl and attached to the carburetor air box. The intake for the alternate air source has been moved to a point above the engine inside the cowl for additional protection from dust and dirt. The right cowl access door has been eliminated for simplicity and uninterrupted air flow. Cowl flaps have been added for better cooling in take-off and climb.

The new wing strut fillets, standard on the Skylane, are of Royalite and reduce drag. The upper fillets incorporate larger retractable tie-down ring and it is more accessible than formerly.

All three new models use the 230-hp. 6-cylinder Continental O-470 engine, which now incorporates new four-ring pistons for better service.

New streamlined forged upper and lower door hinges replace steel stampings on all three models, providing more rigidity and superior door sealing. A decorative web strengthens the upper hinge between the pin and the front edge of the door.

A new single-piece cast assist step

(Continued on page 46)

Stylish interiors sparkle in the Cessna "middle line" models. Shown below are optional tilting seats, backs of which tilt automatically when bottom is raised to three adjustment positions.

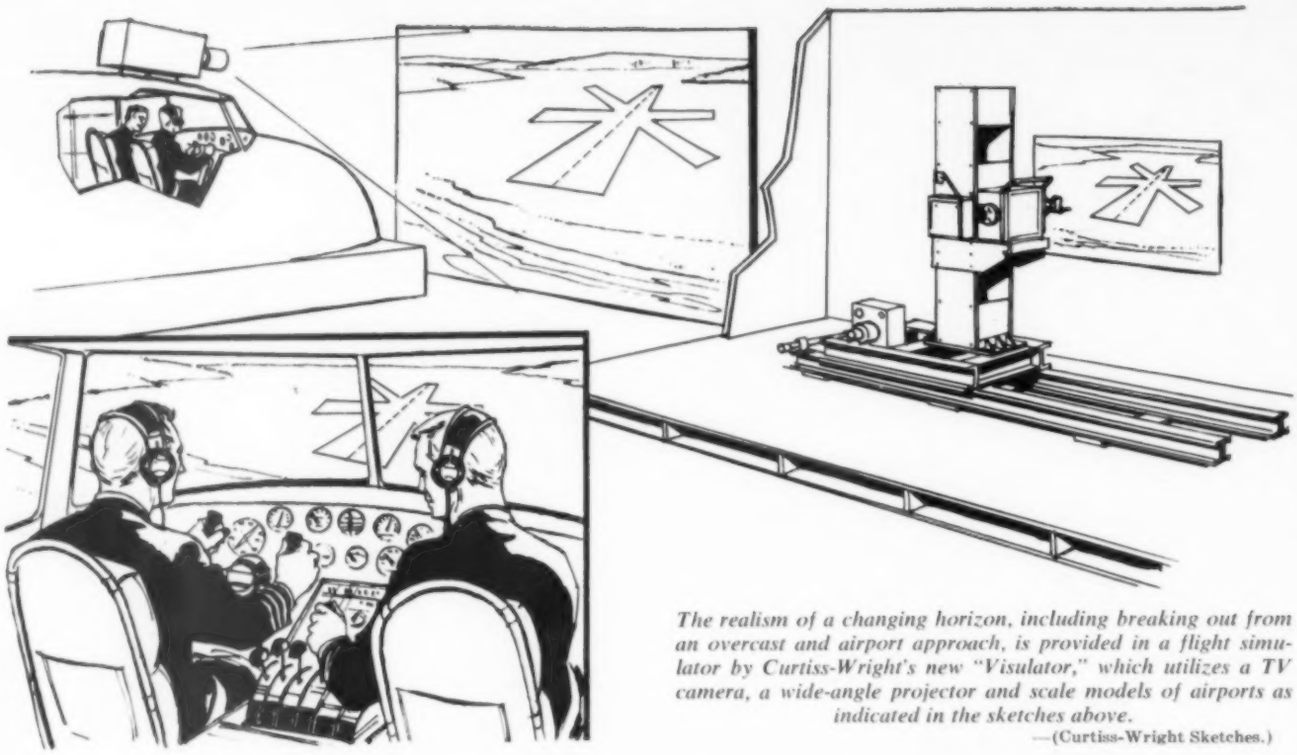
—(Cessna Photos.)

Top-hatted salesmen rolled new Cessnas onto the party floor (above). Nightclub show (right) included orchestra, girls, comic, magician and sound-effects entertainer.
—(Southwest Airmotive Photos.)

Glamor For Sales

CESSNA'S new line of business planes was unveiled in dealer showings at airports all over the country last month. Most glamorous merchandising of the new models was in Dallas, where two Cessna dealers in the same city got together in a single preview "kick-off" followed by a weekend of flight demonstrations at two airports. The kick-off hangar party, with cocktails and a nightclub floor show, spotlighted each new Cessna plane with glamorous Neiman-Marcus fashion models while an emcee sang the praises of Cessna and business flying. The big hangar party enabled 400 business leaders to examine the new airplanes, the public airport showings drew 4,000 interested persons, of whom 18 became prime prospects, according to the two sponsoring dealers — Southwest Airmotive and Dal-Tex Aviation. They threw their party at Southwest's big new business flying terminal on Love Field and conducted their public showings at both Love Field and at nearby Addison Airport, where Dal-Tex is based on a field devoted exclusively to business flying.

Glamorous Neiman-Marcus fashion models (below) helped show the new Cessnas to over 400 invited business leaders (right). Public showings drew 4,000 persons.
—(Southwest Airmotive Photos.)



The realism of a changing horizon, including breaking out from an overcast and airport approach, is provided in a flight simulator by Curtiss-Wright's new "Visulator," which utilizes a TV camera, a wide-angle projector and scale models of airports as indicated in the sketches above.

—(Curtiss-Wright Sketches.)

Visulator Adds Realism To Simulator

REALISTIC vision has been added to the many capabilities of flight simulators through new concepts in optics engineering.

It's now possible for pilots being trained in flight simulators to actually see their landings and take-offs on a screen in proper perspective, thanks to an ingenious application of closed-circuit television principles to conventional flight simulators by the Curtiss-Wright Corporation's Electronics Division.

The company demonstrated the new technique to the nation's aviation press last month at the Carlstadt, New Jersey, plant. The "Visulator" was attached to the Curtiss-Wright Dehmel Electronic Flight Simulator, now in production for major airlines of the world. The demonstration pilot climbed into the cockpit of the flight simulator, an exact duplicate of the actual airplane, and went through every detail of take-off and landing. Ten feet in front of the cockpit is a full, wall-size, panoramic TV screen that provides perfect simulated visual flight on and off the airport. For our demonstration the TV camera in the control room picked up the picture from an exact three-dimensional model of the Idlewild (New York International) airport as the pilot made repeated simulated take-offs, instrument approaches and landings. As in earlier Curtiss-Wright ground trainers, the pilot flies as though he were in an actual plane in flight. Even the sounds of flying are reproduced for complete realism. Breaking in and out of clouds is like the real McCoy.

Nothing is pre-set. The terrain, buildings, runways — every detail — all appear in relation to the precise altitude and flight path being followed by the Simulator. The panoramic view changes to correspond with every movement of the Simulator, just as the scene changes through the cockpit windows of a moving plane. The Simulator-Visulator combination also responds to all the malfunctions and tough weather situations which instructors phase into the training to simulate every possible emergency or condition change that could happen in actual flight.

The great value of the C-W development is appreciated when you consider what it would cost to train flight personnel in the actual airplane. For example, operating costs of a DC-7 are in the $400 per hour bracket and about $1,000 per hour for the jet transports. Since the major terminal airports are already congested, think of the terrific costs of superimposing actual flight training on already-burdened airports and control zones. The trainer will pay for itself many times over in just practicing such emergency procedures as loss of power on take-off at gross load where fuel would have to be actually dumped or burned out prior to landing. To become completely familiar with the roll rates of a modern jet transport, it requires approximately four hours in the air. The Simulator does it on the ground just as well.

No matter how accurately a pilot flies an instrument approach, at some point he must have visual contact with the ground prior to touch down. Never before has it been possible for pilots to practice by simulation this exacting transition procedure from cloud to ground. With the Visulator the pilot actually "sees" the airport, the runway, the lights and surrounding terrain. The miniature models of the airports are exact replicas of enroute and destination fields. A simulated take-off can originate at any airport and the flight can proceed on instruments until cleared to enter the local traffic pattern at the destination. Upon breaking out at some predetermined ceiling, the pilot "sees" the terminal airport and his proper runway ahead.

Here are some of the technical problems solved by C-W's Electronics Division after years of research:

Development of a periscopic television lens by the Perkin-Elmer Cor-

(Continued on page 47)

NARCO SCORES ANOTHER IMPORTANT BREAKTHROUGH

ALL-CHANNEL

Sapphire

1016A

VHF RECEIVER-TRANSMITTER

with TRANSISTORIZED POWER SUPPLY

SAPPHIRE 1016A IS CAA TSO'd for scheduled airline use. Unitized construction permits rapid disassembly and unusual accessibility for servicing. Panel-mounted control switches provide crystal controlled frequency selection for SCS, DCS, or random cross-channel operation. Provision included for simultaneous channeling of glide slope receiver when used for ILS. Unit weight 22 pounds; antenna 3.5 pounds.

SAPPHIRE 1021 90-560 CHANNEL VHF RECEIVER. The receiver unit of the 1016A is now offered as a separate all-channel receiver with transistorized power supply in a short-height ½ ATR unit. When coupled with VOR/LOC converter, permits rapid, precise crystal controlled tuning to all NAV as well as COMM frequencies. Designed especially for the remarkable "2½ Sapphire" system, that gives unusual NAV/COMM flexibility and rapid switching of functions to relieve cockpit load.

TRANSISTORIZED POWER SUPPLY reduces weight of 1016A by 4 pounds, length by 3½ inches, is nearly twice as efficient as equivalent dynameter units. With no moving parts, malfunction is virtually eliminated. Thoroughly proved in thousands of hours of flight and accelerated laboratory testing.

MORE POWER, LIGHTER WEIGHT, SMALLER SIZE AND EVEN GREATER RELIABILITY have been engineered into this new Sapphire 1016A VHF communications unit. Thanks to the development by Narco of a revolutionary transistorized power supply, this latest addition to the popular Sapphire series of airline-quality equipment is more than ever the logical choice for airlines and executive aircraft users for an all-channel VHF communications unit.

The Sapphire 1016A provides you with a 90 to 360-channel transmitter with greatly increased power covering every channel with 50 kc spacing between 118 and 135.95 megacycles; and a 90 to 560-channel receiver covering every frequency from 108 to 135.95 megacycles, with the all-important advantage of permitting crystal controlled tuning to VOR/LOC navigation frequencies.

Sapphire 1016 series equipment is in scheduled airline use, has been re-specified for the U. S. Air Force's Cessna L-27's and is in use in hundreds of corporate aircraft.

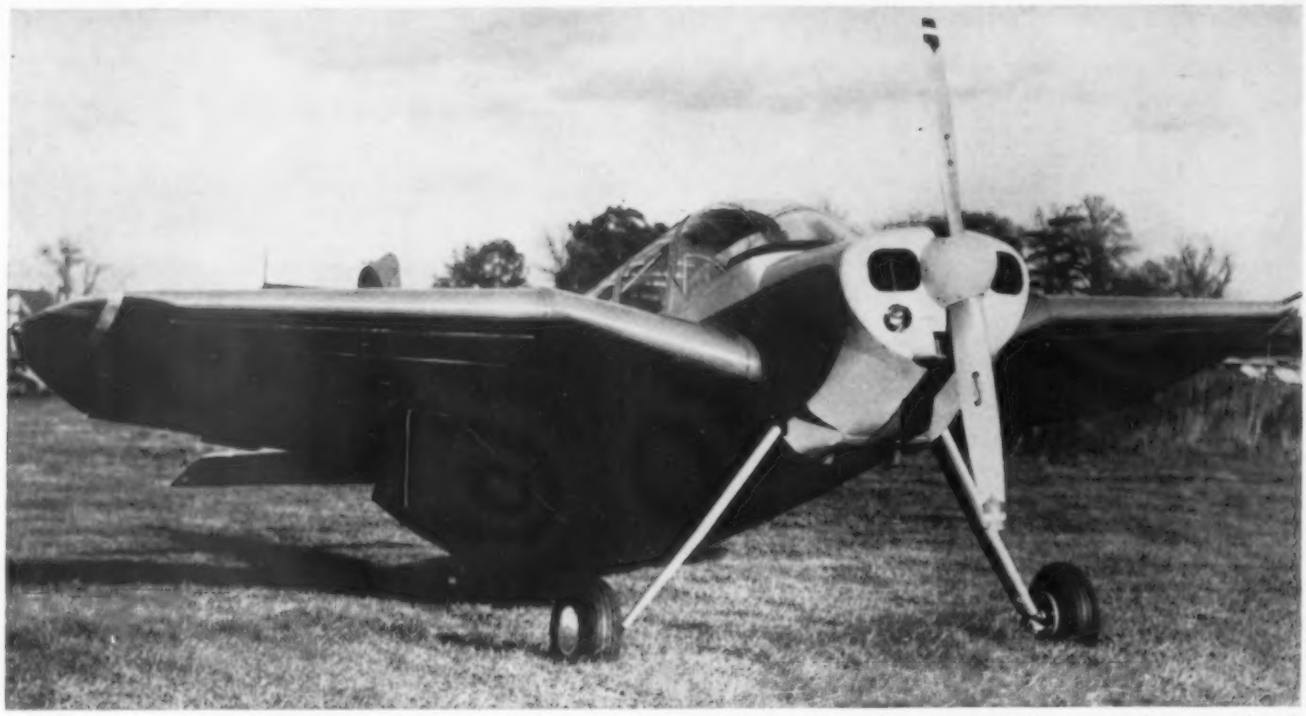
You'll select the Sapphire 1016A because it provides you with all-channel transmission, all-channel reception both NAV and COMM, because it's years ahead in design and reliability, because it's CAA TSO'd for airline use and because it's sensibly priced. See your Narco dealer or write for new brochure.

narco

New! **Send for brand-new booklet describing operation of the "Two and One Half Sapphire System."**

National Aeronautical Corporation, Fort Washington, Pennsylvania

MARK OF THE FINEST COMMUNICATIONS — Sapphire 1016A — 90/360-CHANNEL TRANSMITTER 90/560-CHANNEL RECEIVER



Lanier Paraplane Commuter 110 has 150-hp. Lycoming, stubby span of 20 ft. 7 ins. and grosses 1,280 lbs., at which it will take off or land within 60 feet at less than 30 mph.

Lanier STOL Paraplane

SHORT take-off and landing (STOL) capabilities for lightplanes can make 100-150-yard plots sufficient for operations adjacent to business and industrial plants and in unimproved rural and wilderness patches and thereby greatly increase the usefulness of lightplanes. Such capabilities are possessed by only one U. S. lightplane now in production — the 4-place Helio Courier, latest version of which was described in these columns last month. Now comes Edward M. Lanier with the newest of several "paraplane" designs he has been working with down through the years. His latest is smaller than the Helio Courier and could be marketed in 2-place and 4-place versions.

The Lanier Paraplane Commuter 110, a patented semi-flying wing design, is a single-place prototype which has been flying for several months with a 150-hp. Lycoming engine. Lanier says it will hover at only 15 mph. or fly at a top speed of 165 mph., giving it a phenomenal speed range of 11 to 1. He says it will cruise at 150.

Take-off and landing speed is said

Semi-flying wing design has 111 sq. ft. of area and features full-span flaps, "flaperons" and Vacu-jet devices for natural boundary layer control of the air flow.

High-lift wing of Lanier Paraplane with leading-edge Vacu-jet device open for airflow control at low speed and high angle of attack. Note large flap area.

to be less than 30 mph., with take-off and landing distance being a mere 60 feet and take-off over a 50-ft. obstacle said to be only 165 feet. Lanier says it will fly with good control at 25 mph. and will hold altitude with power at only 15 mph. Its rate of climb is 1,500 feet per minute. All of this performance is at a gross weight of 1,280 lbs., at which it is said to have a 500-lb. useful load. Span is 20 ft. 7 ins. and length is 21 feet. Normal fuel capacity is 24 gals., with 20-gal. auxiliary tanks in the wing.

The Lanier wing has 111 sq. ft. of area. It features full-span flaps, "flap-erons" and Vacu-jet devices which give it what Lanier describes as "natural" boundary layer control.

The designer has not announced any plans for production but says he can produce the 2-place version to sell for $5,000 to $9,000 and the 4-place version, with 180-hp. engine, 1,000-lb. useful load at 2,200-lb., gross weight, 20-mph. slow speed and 171-mph. top speed with 154-mph. cruise, to sell for $8,000 to $12,000.

"The Paraplane has anti-stall, anti-slip-off and anti-spin qualities not found in any other aircraft," the designer says. "It offers safety and utility through the use of advanced aerodynamics rather than through highly-skilled piloting. It will eliminate the need for airports."

Prototype Lanier Paraplane Commuter 110 has been flying for several months. It has 1,500-fpm. rate of climb and can hold altitude with power at only 15 mph. Lanier Aircraft Corp. is at Marlton-Medford Airport, Marlton, N. J.

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The Mark 20 and Mark 20A — the world's most efficient airplane — is sold and serviced by aviation-experienced distributors and dealers throughout the U.S. and in many parts of the world. The advanced design of the Mooney planes provides your greatest value in performance, economy and comfort.

We, distributors and dealers of Mooney Aircraft, invite you to see and fly the Mark 20 and Mark 20A . . . and we assure our many customers of fast, efficient factory-like maintenance service.

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Merced Air Service
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GEORGIA:
*Hill's Aircraft Sales & Service
Fulton County Airport
Atlanta, Ga.

IDAHO:
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Hyde Field
Downey, Idaho

ILLINOIS:
*Capitol Aviation, Inc.
Capitol Airport
Springfield, Ill.

*National Aero Sales Corp.
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Chicago 38, Ill.

IOWA:
*Airways Service, Inc.
Municipal Airport
Sioux City, Iowa

KANSAS:
Aviation Enterprises, Inc.
Fairfax Airport
Kansas City, Kansas

*Kansas City Mooney Sales
Corn Belt Aviation
Ottawa, Kansas

LOUISIANA:
Shreve-Aire, Inc.
Downtown Airport
Shreveport, La.

MICHIGAN:
*Skylark Flying Service
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Detroit City Airport
Detroit, Michigan

MINNESOTA:
*Willmar Air Service, Inc.
Municipal Airport
Willmar, Minnesota

MISSOURI:
Cy Willock, Inc.
905 Perimeter Rd.
Municipal Airport
Kansas City, Missouri

NEVADA:
Tahoe Helicopters
Reno Municipal Airport
Reno, Nevada

NEW MEXICO:
*Uranium Frontier Airways
Airport Road
Grants, N. M.

NORTH CAROLINA:
High-Point Trinity Air Service
Darr Field
High Point, N. C.

*Southeast Airmotive Corp.
Douglas Municipal Airport
Charlotte, N. C.

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*Pietsch Flying Service
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Lower initial cost, economy of operation and maintenance adds up to money saved for Mooney owners. Make the comparison test . . . compare performance, compare economy and compare features.

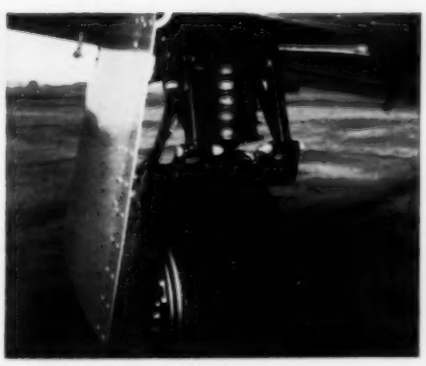
Mooney provides more speed per horsepower than any other four-place plane . . . . 180 m.p.h. cruise, powered by dependable Lycoming 180 h.p. engine.

In economy, Mooney is 'way out front. It's a fact that Mooney costs less than its three leading competitors, both in initial cost and in operation. One plane in the same class as the Mark 20A costs some $400.00 *more* for each 100 hours of operation. Over a period of one year and 400 hours of flying, the operational cost is some $1600 more than it is in a Mooney. Combine this with an initial cost saving of $4,000 and it adds up to a first year *saving* of some $5,600.00.

In features, Mooney provides greater safety and is setting a tomorrow's pace today. Compare these positive Mooney advantages . . . flexible, laminar flow wing; retractable landing gear . . . 2 seconds up, 2 seconds down; tubular steel cabin frame with stainless steel fire wall; 15-to-1 glide ratio; contoured cushion construction with no-sag springs; low-wing visability; and airline-type ventilation system.

There's no doubt, you'll be money ahead when you buy the new, new '59 Mooney Mark 20A. Make comparisons, prove to yourself why it is the right airplane for fast, inexpensive transportation. See your Mooney distributor or dealer now.

Mooney aircraft, inc.
Kerrville, Texas



Ten Leading States in Number of Active General Aviation Aircraft

(FLIGHT MAGAZINE Compilation From FAA Registrations January 1, 1958)

	Non-Airline Multi-Engine	Postwar SE 4-5-Place	All Other	Total Active Aircraft, Inc. Air Carrier
1. California	498	2,968	4,412	7,970
2. Texas	689	2,052	2,676	5,552
3. Illinois	278	1,554	1,752	3,782
4. New York	350	831	1,517	3,240
5. Ohio	332	1,182	1,590	2,106
6. Michigan	215	1,082	1,511	2,812
7. Pennsylvania	239	831	1,359	2,429
8. Florida	195	651	1,129	2,079
9. Indiana	126	793	1,006	1,933
10. Washington	41	551	1,103	1,722
Totals	2,963	11,535	18,055	33,625

Distribution Of Active Aircraft

FEDERAL Aviation Agency (formerly CAA) registrations of civil aircraft in Washington show there were 67,153 active civil aircraft as of January 1, 1958, a 4% increase over the 64,688 registered on January 1, 1957. The 1958 figure is the latest available.

But where are these airplanes concentrated? What is the breakdown by types? The answers to these questions and other interesting facts and trends have been obtained from a study of a complete report issued by the Department of Commerce. "Active" aircraft are defined as those holding a valid airworthiness certificate and which have had a periodic approved inspection within the past 12 months.

Of the 67,153 active civil aircraft registered, 1,864 are scheduled and irregular air carrier transports, an increase for the year of 62 transports. These airliners represent only 2.8% of the total active civil airfleet. Multi-engine general aviation aircraft total 5,036, an increase of 20% for the year. They represent 7% of the total active fleet. General aviation postwar single-engine 4-place and larger aircraft number 23,751, an increase of almost 1,000 for the year. These planes represent 35% of the total active air fleet. All other active general aviation aircraft, mostly 2- and 3-place lightplanes, total 35,821 in number — they comprise over half of the total active air fleet.

From a non-airline marketing standpoint, the prime fleet consists of the 5,036 general aviation multi-engine aircraft and the 23,752 postwar single-engine 4-place and larger aircraft — a combined total of only about 28,000 active aircraft. No figures are available, but it is generally acknowledged that most of the non-airline civil flying is performed by about 25,000 of these postwar aircraft.

More than half of the total active air fleet is concentrated in only 10 states. They are (1) California, 7,970; (2) Texas, 5,552; (3) Illinois, 3,782; (4) New York, 3,240; (5) Ohio,

Active U. S. Civil Aircraft by States, with Counties Having 50 or More Aircraft

FLIGHT MAGAZINE COMPILATION FROM FAA REGISTRATIONS JAN. 1, 1958

Column 1: State and County Column 2: Total Active Aircraft Column 3: Air Carrier Column 4: Gen. Av. Multi-Engine
Column 5: Gen. Av. Postwar 4-pl. & over Single-Engine Column 6: Gen. Av. All Other Column 7: Public Airports Column 8: Limited Airports

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8
ALABAMA	597	10	43	206	338	40	23
1. Jefferson	111	10	19	39	43	2	0
2. Montgomery	63	0	4	22	37	3	0
ARIZONA	838	4	43	317	474	57	94
1. Maricopa	481	4	26	159	292	15	13
2. Pima	97	0	7	47	43	8	5
3. Pinal	82	0	1	26	55	4	12
ARKANSAS	812	0	32	239	541	51	30
1. Pulaski	145	0	16	68	61	2	1
2. Arkansas	73	0	0	11	62	3	0
3. Phillips	53	0	1	3	49	1	0
CALIFORNIA	7,970	92	498	2,968	4,412	230	160
1. Los Angeles	2,535	70	230	946	1,289	16	7
2. San Diego	420	1	11	171	237	13	14
3. Alameda	351	7	32	139	173	4	2
4. Orange	308	0	15	121	172	4	0
5. Sacramento	269	0	11	102	156	6	5
6. Kern	266	0	9	83	174	10	14
7. Santa Clara	250	0	15	92	143	5	2
8. Fresno	248	0	7	84	157	8	4
9. San Bernadino	231	0	18	96	117	16	15
10. San Francisco	211	10	36	61	104	0	0
11. Riverside	163	0	4	56	103	10	5
12. Contra Costa	162	0	8	63	91	2	1
13. San Joaquin	154	0	4	59	91	7	0
14. Tulare	143	0	4	42	97	8	2
15. Imperial	135	0	5	42	88	5	3
16. Stanislaus	134	0	7	65	62	3	1
17. Humbo'dt	133	0	5	73	55	6	4
18. San Mateo	132	4	7	49	72	3	0
19. Ventura	120	0	7	38	75	6	5
20. Merced	116	0	0	28	88	3	0
21. Monterey	111	0	11	26	74	3	3
22. Santa Barbara	100	0	12	39	49	6	4
23. Sonoma	100	0	2	39	59	2	3
24. Yolo	88	0	2	30	56	4	4
25. Mendocino	85	0	4	45	36	1	3
26. Butte	81	0	1	31	49	3	2
27. Kings	73	0	4	22	47	5	4
28. Marin	68	0	3	27	38	2	1
29. Glenn	54	0	2	17	35	3	4
30. Colusa	51	0	1	11	39	2	5
31. Shasta	51	0	4	32	15	4	1
COLORADO	942	34	63	340	505	47	48
1. Denver	341	34	34	105	167	1	0
2. Mesa	55	0	2	30	23	1	0
3. Weld	54	0	0	10	44	1	2
4. El Paso	53	0	9	13	31	2	1
CONNECTICUT	524	0	48	182	294	19	9
1. Hartford	193	0	32	67	94	6	0
2. Fairfield	122	0	5	44	73	1	3
3. New Haven	84	0	9	27	48	4	0
DELAWARE	219	7	32	73	107	11	8
1. New Castle	143	6	30	48	59	5	2
DISTRICT OF COLUMBIA	331	68	91	66	106	1	0
FLORIDA	2,079	104	195	651	1,129	101	36
1. Dade	616	82	90	146	298	4	1
2. Broward	166	6	19	76	65	6	0
3. Orange	135	0	7	46	82	3	1
4. Duval	120	7	12	36	65	6	1
5. Palm Beach	120	0	16	32	72	4	2
6. Pinellas	98	9	4	50	35	3	2
7. Hillsborough	80	0	8	28	44	4	1
8. Volusia	76	0	2	28	46	3	1
9. Polk	57	0	6	24	27	5	0
10. St. Lucie	53	0	3	8	42	4	0
11. Brevard	50	0	2	12	36	3	1
GEORGIA	901	81	49	295	476	63	32
1. Fulton	287	81	22	100	84	3	0

2,106; (6) Michigan, 2,812; (7) Pennsylvania, 2,429; (8) Florida, 2,079; (9) Indiana, 1,933, and (10) Washington, 1,722.

26 Leading Counties

A total of 14,452 active civil aircraft are concentrated in only 26 counties having 300 or more aircraft each. These counties, their national ranking and number of active aircraft, are as follows:

(1) Los Angeles, Cal., 2,535; (2) Cook, Ill., 1,489; (3) New York City, 1,139; (4) Dallas, Tex., 773; (5) Harris, Tex., 710; (6) Wayne, Mich., 682; (7) Dade, Fla., 682; (8) King, Wash., 561; (9) Sedgwick, Kas., 551; (10) Jackson, Mo., 535; (11) Hennepin, Minn., 530; (12) Maricopa, Ariz., 481; (13) Tulsa, Okla., 425; (14) San Diego, Cal., 420; (15) St. Louis, Mo., 375; (16) Cuyahoga, Ohio, 367; (17) Tarrant, Tex., 364; (18) Alameda, Cal., 351; (19) Milwaukee, Wis., 345; (20) Denver, Colo., 341; (21) Multnomah, Ore., 332; (22) Dist. Columbia, 331; (23) Allegheny, Pa., 323; (24) Orange, Cal., 308; (25) Marion, Ind., 302, and (26) Oakland, Mich., 300.

Counties Having Most Twins

Perhaps the most interesting compilation concerns the concentration of non-airline multi-engine civil aircraft, for these are mostly the new light twins which provide round-the-clock transportation and thus receive more frequent utilization than single-engine types. More than seven-eighths of them are based at airports which also handle airline schedules. More than 3,000 Aero Commanders, Beechcrafts, Piper Apaches and Cessna 310's were produced in the last four years. The heaviest concentration of twins is in the nation's more prosperous areas where business and industry are expanding. Thirty-one counties have 30 or more twins, seventeen of them hav-

Column 1: State and County Column 2: Total Active Aircraft Column 3: Air Carrier Column 4: Gen. Av. Multi-Engine
Column 5: Gen. Av. Postwar 4-pl. & over Single-Engine Column 6: Gen. Av. All Other Column 7: Public Airports Column 8: Limited Airports

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8
2. DeKalb	54	0	2	22	30	1	0
IDAHO	639	0	25	250	364	57	119
1. Ada	140	0	10	68	62	3	1
2. Canyon	51	0	2	17	32	2	6
ILLINOIS	3,782	198	278	1,554	1,752	106	167
1. Cook	1,489	198	158	569	564	12	6
2. DuPage	159	0	5	71	83	5	8
3. Winnebago	122	0	23	42	57	3	6
4. Champaign	109	0	5	34	70	2	2
5. Lake	108	0	5	55	48	4	4
6. Kane	100	0	9	38	53	2	3
7. Rock Island	87	0	7	42	38	1	0
8. St. Clair	87	0	4	34	49	2	1
9. Madison	84	0	10	43	31	3	1
10. Sangamon	75	0	10	45	20	2	1
11. LaSalle	70	0	1	30	39	4	9
12. Peoria	70	0	7	36	27	2	0
13. Will	67	0	2	29	36	3	10
14. Macon	58	0	2	27	29	1	0
INDIANA	1,933	8	126	793	1,006	94	31
1. Marion	302	8	30	142	122	3	0
2. Lake	160	0	3	63	94	6	1
3. St. Joseph	118	0	6	46	66	3	2
4. Elkhart	112	0	12	48	52	4	0
5. Allen	105	0	17	45	43	2	1
6. Delaware	67	0	12	37	18	2	0
7. Madison	65	0	2	37	26	3	1
8. Vanderburgh	50	0	8	28	14	2	0
IOWA	1,621	0	49	661	911	72	86
1. Polk	167	0	10	86	71	2	3
2. Linn	74	0	5	29	40	2	2
3. Woodbury	59	0	5	23	31	1	0
KANSAS	1,715	0	96	772	847	107	84
1. Sedgwick	551	0	59	270	222	7	6
2. Shawnee	111	0	7	51	53	3	0
3. Wyandotte	68	0	5	28	35	1	0
4. Johnson	59	0	2	26	31	4	1
KENTUCKY	478	0	37	230	211	22	26
1. Jefferson	160	0	17	86	57	3	1
LOUISIANA	1,021	1	112	329	579	40	36
1. Caddo	174	0	36	50	88	3	3
2. Orleans	143	0	24	50	69	1	1
3. E. Baton Rouge	91	0	13	56	22	2	0
4. Calcasieu	59	0	5	14	40	1	2
5. Lafayette	53	0	13	17	23	1	1
6. Ouachita	52	1	2	19	30	1	0
MAINE	330	0	3	108	219	36	79
1. Penobscot	69	0	1	23	45	5	11
MARYLAND	609	0	45	195	369	26	21
1. Baltimore City	199	0	23	60	116	0	0
2. Prince Georges	71	0	3	22	46	3	4
3. Montgomery	66	0	3	18	45	1	1
MASS.	947	29	66	289	563	46	41
1. Middlesex	181	0	6	57	118	3	10
2 Wooster	133	0	7	38	88	9	4
3. Suffolk	111	28	12	25	46	2	1
4. Essex	98	0	8	26	64	3	4
5. Hampden	84	0	6	35	43	4	2
6. Norfolk	78	1	5	27	45	1	3
7. Bristol	59	0	4	21	34	6	4
8. Barnstable	50	0	8	13	29	5	2
MICHIGAN	2,812	4	215	1,082	1,511	114	81
1. Wayne	682	3	102	276	301	6	1
2. Oakland	300	0	17	140	143	4	1
3. Ingham	137	0	16	58	63	2	2
4. Genesee	132	0	4	54	74	3	0
5. Macomb	129	0	5	38	86	4	1
6. Kent	110	0	9	45	56	2	2
7. Washtenaw	84	0	4	28	52	2	1
8. Kalamazoo	83	0	8	35	40	2	1
9. Jackson	80	1	5	39	35	2	0
10. Berrien	73	0	10	27	36	3	0
11. St. Clair	64	0	1	24	39	3	1
12. Calhoun	58	0	7	13	38	2	0
13. Muskegon	50	0	2	13	35	1	2
MINNESOTA	1,994	71	93	592	1,238	76	124
1. Hennepin	530	24	54	180	272	3	0
2. Ramsey	211	46	16	56	93	2	0
3. St. Louis	150	0	3	37	110	4	8
MISSISSIPPI	636	0	17	139	480	47	27
1. Washington	68	0	1	9	58	5	2
MISSOURI	1,646	204	102	584	756	74	41
1. Jackson	535	184	37	176	138	2	1
2. St. Louis City	235	20	41	93	81	0	0
3. St. Louis	140	0	7	58	75	2	1
4. Greene	58	0	5	23	30	2	0
MONTANA	927	1	37	330	559	62	90
1. Yellowstone	121	0	11	69	41	1	0
2. Cascade	68	0	3	32	33	1	1
3. Missoula	53	1	9	14	29	1	3
NEBRASKA	1,111	0	48	382	681	80	91
1. Douglas	196	0	27	82	87	3	1
2. Lancaster	97	0	5	44	48	3	0
NEVADA	320	13	39	100	168	27	30
1. Douglas	120	13	21	34	52	6	3
2. Washoe	78	0	9	26	43	2	4
NEW HAMPSHIRE	170	0	12	48	110	13	19
NEW JERSEY	1,269	12	113	462	682	52	52
1. Bergen	226	2	26	104	94	1	4
2. Essex	120	2	12	43	63	2	0
3. Camden	93	0	5	31	57	3	1
4. Union	90	0	20	30	40	1	0
5. Mercer	85	1	7	29	48	3	4
6. Morris	85	0	8	32	45	3	2
7. Passaic	72	0	10	32	30	1	1
8. Monmouth	62	0	4	29	29	4	2
9. Middlesex	55	0	6	17	32	1	2
10. Somerset	53	0	2	19	32	3	2
NEW MEXICO	630	0	40	306	284	41	59
1. Bernalillo	159	0	13	87	59	4	0
2. Eddy	66	0	2	22	42	2	0
3. Chaves	55	0	4	18	33	2	5
4. Lea	54	0	3	26	25	4	4
NEW YORK	3,240	542	350	831	1,517	96	171
1. N. Y. City	1,139	520	214	172	233	5	8
2. Nassau	196	0	23	74	99	0	4
3. Suffolk	182	0	4	53	125	8	8
4. Erie	144	0	15	36	93	2	9
5. Westchester	136	0	24	52	60	2	2

ing 50 or more. These counties account for 2,186 of the non-airline multi-engine aircraft in the U. S., which total 4,961 excluding 75 in Alaska, Hawaii, Puerto Rico, the Virgin Islands and other areas. Without exception, the counties with 30 or more twins are the world's leading business flying centers. They are as follows: (1) Los Angeles, Cal., 230; (2) New York City, 214; (3) Harris, Tex., 171; (4) Cook, Ill., 158; (5) Dallas, Tex., 148; (6) Wayne, Mich., 102; (7) Dist. Columbia, 91; (8) Dade, Fla., 90; (9) Tulsa, Okla., 82; (10) Allegheny, Pa., 73; (11) Sedgwick, Kas., 59; (11) Oklahoma, Okla., 55; (13) Hennepin, Minn., 54; (14) Tarrant, Tex., 53; (15) Milwaukee, Wis., 52; (16) Bexar, Tex., 50; (16) Cuyahoga, Ohio, 50; (18) Multnomah, Ore., 43; (19) St. Louis, Mo., 41; (20) Jackson, Mo., 37; (21) Caddo, La., 36; (21) San Francisco, Cal., 36; (23) Denver, Colo., 35; (23) Montgomery, Ohio, 35; (25) Mahoning, Ohio, 34; (26) Hamilton, Ohio, 33; (27) Hartford, Conn., 32; (27) Alameda, Cal., 32; (29) Marion, Ind., 30; and (29) New Castle, Del., 30.

38,701 Planes on 1,295 Airports

Accompanying this article is a listing of all counties in the U. S. having 50 or more active civil aircraft. There are about 256 such counties. They base 38,701 of the nation's 65,863 active civil aircraft (Alaska accounts for 1,090, Hawaii 113, Puerto Rico 51, Virgin Islands 5 and other countries 31 in the FAA compilation) on 1,295 of the 6,151 domestic airports listed in the compilation.

Copies of the Department of Commerce publication, "U. S. Active Civil Aircraft by State and County, January 1, 1958," may be obtained for 50 cents each from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Column 1: State and County Column 2: Total Active Aircraft Column 3: Air Carrier Column 4: Gen. Av. Multi-Engine
Column 5: Gen. Av. Postwar 4-pl. & over Single-Engine Column 6: Gen. Av. All Other Column 7: Public Airports Column 8: Limited Airports

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8
6. Monroe	121	0	10	39	72	3	6
7. Onondaga	117	0	9	43	65	4	6
8. Broome	64	0	8	23	33	3	2
9. Niagara	62	0	2	20	40	5	3
10. Albany	60	0	4	24	32	3	2
11. Dutchess	59	2	4	11	42	1	1
12. Tompkins	55	20	2	9	24	2	3
13. Chataqua	52	0	2	17	33	5	0
14. Orange	52	0	1	14	37	4	2
N. CAROLINA	1,170	19	72	393	686	59	42
1. Mecklenburg	140	0	17	63	60	3	2
2. Guilford	120	0	12	50	58	3	2
3. Forsyth	100	17	17	23	43	1	0
N. DAKOTA	685	0	5	134	546	44	121
1. Cass	75	0	5	11	59	1	5
OHIO	3,106	2	332	1,182	1,590	114	157
1. Cuyahoga	367	0	50	148	169	6	3
2. Franklin	253	0	27	103	123	6	5
3. Montgomery	232	0	35	87	110	2	2
4. Hamilton	205	0	33	84	88	3	5
5. Summit	151	0	19	56	76	2	5
6. Stark	133	0	17	51	65	5	3
7. Mahoning	116	2	34	33	47	8	1
8. Lucas	106	0	21	44	41	2	1
9. Butler	73	0	9	32	32	3	0
10. Lake	60	0	7	21	32	2	3
11. Lorain	59	0	4	21	34	5	5
12. Clark	55	0	3	23	29	1	1
OKLAHOMA	1,402	0	176	524	702	77	41
1. Tulsa	425	0	82	149	194	5	0
2. Oklahoma City	267	0	55	115	97	4	1
3. Grady	63	0	0	5	58	1	0
4. Kay	53	0	6	25	22	3	1
OREGON	1,256	4	84	499	669	49	67
1. Multnomah	332	4	43	150	135	3	1
2. Lane	97	0	5	36	56	2	2
3. Marion	69	0	6	21	42	2	1
4. Linn	64	0	1	25	38	3	7
5. Klamath	56	0	2	19	35	2	7
6. Washington	56	0	2	23	31	2	1
7. Umatilla	55	0	1	21	33	2	2
8. Douglas	51	0	1	20	30	2	3
PENN.	2,429	0	239	831	1,359	132	146
1. Allegheny	323	0	73	100	150	6	3
2. Philadelphia	157	0	26	49	82	3	1
3. Montgomery	142	0	11	56	75	7	10
4. Bucks	117	0	2	28	87	6	10
5. Delaware	76	0	6	29	41	0	3
6. Lehigh	74	0	6	27	41	4	0
7. Chester	72	0	2	25	45	4	6
8. Clinton	71	0	16	27	28	1	1
9. Cumberland	67	0	7	22	38	2	3
10. Dauphin	66	0	5	26	35	2	2
11. Lancaster	65	0	3	19	43	5	5
12. York	65	0	9	25	31	3	3
13. Berks	62	0	11	27	24	5	2
14. Butler	56	0	4	18	34	2	3
15. Westmoreland	50	0	3	16	31	3	3
RHODE ISLAND	146	0	7	49	90	6	3
1. Providence	70	0	5	22	43	2	0
S. CAROLINA	390	0	20	128	242	32	29
1. Charleston	56	0	3	21	32	4	1
S. DAKOTA	715	0	6	189	520	50	20
1. Minnehaha	82	0	0	33	49	1	0
2. Pennington	76	0	3	26	47	3	1
TENNESSEE	721	15	62	265	379	37	11
1. Shelby	229	0	25	85	119	4	0
2. Davidson	107	13	23	37	34	3	0
3. Hamilton	62	0	4	33	25	1	0
4. Knox	59	0	1	25	33	1	1
TEXAS	5,552	135	689	2,052	2,676	210	267
1. Dallas	773	96	148	250	279	10	5
2. Harris	710	24	171	272	243	6	1
3. Tarrant	364	15	53	107	189	7	5
4. Bexar	281	0	50	112	119	3	0
5. Hidalgo	156	0	6	43	107	8	2
6. El Paso	148	0	24	61	63	1	2
7. Jefferson	125	0	4	36	85	3	1
8. Cameron	120	0	3	23	94	7	0
9. Nueces	119	0	18	54	47	4	0
10. Potter	118	0	16	54	48	0	0
11. Lubbock	116	0	18	57	41	1	1
12. Wichita	106	0	23	51	32	3	2
13. Taylor	100	0	17	61	22	1	0
14. Travis	90	0	9	45	36	1	1
15. Midland	85	0	19	45	21	2	0
16. Ector	80	0	18	39	23	1	0
17. Brazoria	78	0	4	17	57	3	6
18. Reeves	70	0	1	13	56	1	1
19. Hale	62	0	1	30	31	1	1
20. McLennan	51	0	4	20	27	1	1
UTAH	388	0	14	163	211	40	13
1. Salt Lake	151	0	7	64	80	4	1
VERMONT	108	0	6	32	70	13	10
VIRGINIA	868	62	55	254	497	45	55
1. Arlington	185	62	5	35	83	0	0
2. Henrico	83	0	11	27	45	2	1
3. Norfolk	71	0	3	20	48	2	0
WASHINGTON	1,722	27	41	551	1,103	74	105
1. King	561	26	25	166	344	9	10
2. Spokane	129	0	3	51	75	4	4
3. Pierce	119	0	4	32	83	4	4
4. Yakima	103	0	0	34	69	5	4
5. Benton	64	0	1	15	48	1	6
6. Walla Walla	59	0	2	20	37	2	0
7. Chelan	56	0	0	20	36	3	2
8. Clark	55	0	1	13	41	4	0
9. Snohomish	55	1	1	12	41	3	2
10. Okanogan	53	0	0	26	27	3	11
W. VIRGINIA	385	0	21	132	232	24	26
WISCONSIN	1,410	0	117	436	857	84	66
1. Milwaukee	345	0	52	119	174	3	0
2. Dane	113	0	9	33	71	2	3
3. Rock	71	0	6	24	41	3	0
4. Waukesha	53	0	4	16	33	2	1
5. Winnebago	52	0	7	15	30	2	1
WYOMING	367	0	18	146	203	26	33
1. Laramie	51	0	5	33	13	1	0

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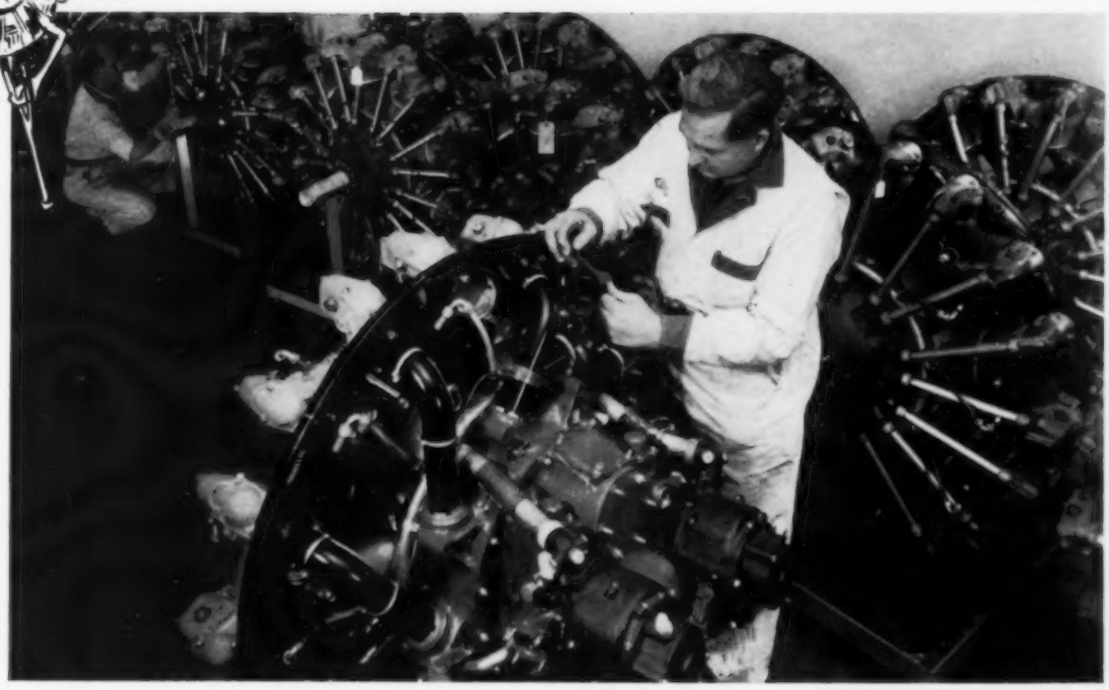

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Cully Weadock (above) of Chesapeake and Potomac Airways, Baltimore, is new president of Helicopter Association of America. Scene at HAA convention (left) shows Hiller copter on motel roof and Republic Alouette copter on trailer in foreground.

Operators Will Promote Copter Services

GROWTH reports and discussions of problems of the operating helicopter business highlighted the 11th annual convention of the Helicopter Association of America last month at San Mateo, California. About 300 industry representatives attended. The Association is composed of companies and individuals operating commercial helicopters.

Aviation's newest commercial activity, helicopter operations have grown steadily since the commercial copter's beginning after World War II. Richard D. Eccles of Calicopters, outgoing HAA president, reported there are now over 100 commercial operators inside U. S. and Canada, including private firms who use helicopters, and they operated nearly 600 helicopters in 1958, representing a total capital investment of some $30,000,000. Eccles said these figures represent a growth of about 10% over 1957, and estimated that commercial copter operators grossed about $30,000,000, or the same as their combined investment.

Declaring the operating industry is "on the threshold of a major growth breakthrough" — it has passed the point of having to prove its machines and their practical work capabilities — Eccles said the operators should become more active in promoting the usefulness of commercial copters on a national and international basis. Up to now, this promotion has been performed mostly, if not totally, by the manufacturers of helicopters. "Operators have to share this load now," Eccles suggested, "by effectively getting the facts to industries and business and working with users to develop techniques and applications." If they do this, he said, operators can "speed realization of the tremendous potential which the helicopter still holds for industry." The Association is working to establish ways and means to supply technical and helpful information to users and operators alike. What is needed, Eccles said, is a cooperative effort by the operators to carry the helicopter's story forcefully and factually to the using public as well as to the helicopter and aircraft industries.

Manufacturers showed their copters at the meeting. Here's Bell's Cap Kembro (left) with a 47J and talking with Tom McNulty, who flies Northrop Aircraft's Bell 47J.
—(Marv Krieger Photo.)

A challenge for helicopter manufacturers to reduce copter costs and to avoid "overcrowding" the operating ranks was voiced by Robert L. Suggs, president of Petroleum Helicopters, Inc., of New Orleans and Lafayette, La., which operates the largest fleet of commercial copters. Suggs told the operators that the operating industry, spawned by helicopter manufacturers, has now grown to the point where "it is like the tail wagging the dog — we ought to tie ourselves loose from the manufacturers." He appealed to copter manufacturers to help operators by: (1) actively seeking to reduce equipment costs; (2) staying out of the operating business, both direct operations under the guise of product or market development and in the maintenance and overhaul fields; (3) halting lease practices which puts financial strength into marginal commercial operations which thus gain an unfair advantage over the existing operator who buys and pays for his equipment, and (4) issuing more accurate and reliable information and specifications about the capabilities of helicopters.

Suggs believes closer cooperation among manufacturers, operators and military agencies could reduce heli-

(Continued on page 52)

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Monahans — Monahans Municipal Airport
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BROWNING AERIAL SERVICE
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Austin, Texas

DES MOINES FLYING SERVICE, INC.
Municipal Airport
ATlantic 8-2218
Des Moines, Iowa

ELLIOTT FLYING SERVICE, INC.
Davenport Municipal Airport
P. O. Box 418
2-2689
Davenport, Iowa

EXECUTIVE AIRMOTIVE, INCORPORATED
Stewart Air Park
P. O. Box 70
GArfield 8-3581, *GArfield* 2-7277
Parkersburg, West Virginia

J & J AIRCRAFT, INC.
Sarasota-Bradenton Airport
821 *General Arnold Road*
ELgin 5-6868
Sarasota, Florida

KEN-MAR AIRPARK, INC.
Ken-Mar Airpark
Box 2667, *University Station*
MUrray 3-6589
Wichita, Kansas

LOUISIANA AIRCRAFT
Downtown Airport
P. O. Box 1428
WAlnut 1-9618
Baton Rouge, Louisiana

PIEDMONT AVIATION, INC.
Smith Reynolds Airport
PArk 5-0511
Winston-Salem, North Carolina

RED AIRCRAFT SERVICE, INC.
Broward County International Airport, Building 78
JAckson 3-9624
Fort Lauderdale, Florida

SOUTHERN FLIGHT SERVICE, INC.
Douglas Municipal Airport
P. O. Box 1211
EXchange 9-6374
Charlotte, N. C.

SPARTAN AIRCRAFT COMPANY
Aviation Service Division
Tulsa Municipal Airport
TEmple 5-4491
Tulsa, Oklahoma

ST. LOUIS FLYING SERVICE
Lambert Municipal Airport
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MORE PEOPLE HAVE BOUGHT PIPERS THAN ANY OTHER PLANE IN THE WORLD

CESSNA'S MIDDLE LINE

(Continued from page 30)

makes for easier entrance in the 182 and Skylane. With a wing-walk material, the top of the step extends about 5 inches forward of the landing gear strut. Doors have a more rigid door stop which locks the door in the open position.

All three airplanes have a completely new instrument panel. It has a shock-mounted flight group in front of the pilot, with controls for flight and navigation instruments. Engine instruments are grouped on a stationary panel, locating fuel capacity, oil pressure and oil temperature gauges above the glove compartment. At the top center of the panel, provision is made for two radios and an ADF. This places radios so that they may be handily operated from either front seat without moving the eyes from the direction of flight, thus eliminating fumbling and groping for controls.

Space for the new optional Tactair automatic flight system controller is provided at the top of the center radio panel.

Below the center radio panel are the tachometer, manifold pressure gauge and cylinder head temperature gauge. The Skylane panel features a vacuum gauge above the ADF with space for optional carburetor air temperature gauge.

Engine controls, electrical switches and circuit breakers are located at the bottom of the center panel.

Instrument panel knobs are redesigned with a new contour for easier use and the mixture control lock now incorporates a center push button control identical to the 180 cowl flap control.

New for the 180, 182 and Skylane is the optional low-cost and pneumatic Tactair "Levelair" automatic flight system, available in T-1, T-2 and T-3 versions. The T-1 is called an "autostability device" — it is fed intelligence from the artificial horizon which activates automatic aileron control to keep the wings level, thus preventing inadvertent spiraling, wandering off course from a wing which is low and providing a smoother ride in rough air. The T-2 adds the Tactair course selector and heading lock — to change course, the pilot simply turns the course selector knob to set the upper compass card for a new heading and the airplane will automatically turn to the new heading. If the course is then manually changed and the controls released, the Tactair T-2 automatically returns the airplane pre-set heading. The T-3 is a complete three-axis autopilot. Elements can be added to convert the T-1 into either a T-2 or a T-3.

Factory prices and weights for Tactair installations in the Skylane or with Group 1B equipment which includes gyros are as follows: T-1, 6 lbs., $795; T-2, 6.5 lbs., $1,095, and T-3, 13 lbs., $2,375. Weights and prices for factory installations in other than the Skylane and including all equipment are as follows: T-1, 17.5 lbs., $1,165; T-2, 22 lbs., $1,610; T-3, 28.5 lbs., $2,895.

New interior door handles are provided and tilting front seats are available as optional in all three airplanes. These seats recline when the bottom is raised to three different adjustment positions. Each tilting seat adds 2.5 lbs. and costs $35 in exchange.

New vinyl-covered, foam-filled sun visors, five inches wide and eleven inches long, are standard on the Skylane and optional on the 180 and 182. Airline-type individual rear seat ventilators are optional.

Billed as a "completely-equipped airplane ready to go," the Skylane includes the following standard equipment which is optional on the 180 and 182: Narco omni transceiver with crystals and low-frequency range, turn and bank indicator, rate of climb indicator, sensitive altimeter, clock, outside air temperature gauge, speed fairings, directional and horizon gyros, sun visors, navigation light flasher, tinted windshield and side windows and tow bar and choice of either Hartzell or McCauley propeller.

For the Skylane, 180 and 182, Cessna offers seven "packaged" factory installation groupings, as follows:

Group 1B, 57 lbs., $2,770 — Narco Mark II Omnigator with 24 crystals (118.0 through 123.0 mc).; 60-channel Wright Executive (118.0-122.9 and 126.0-126.9); 3-way transmitter selector switch; turn and bank indicator; rate of climb indicator; sensitive altimeter; clock; outside air temperature gauge; sun visors; gyro horizon; directional gyro; 50-amp generator.

Group 2, 29 lbs., $1,570 — Narco Mark II Omnigator, turn and bank, rate of climb, sensitive altimeter, clock, outside air temperature and sun visors.

Group 2B, 19 lbs., $1,045 — Same as Group 2 except Narco VHT-3 Superhomer replaces Omnigator.

Group 2C, 25 lbs., $1,140 — Same as Group 2 except Narco VC-27 replaces Omnigator.

Group 2E, 44 lbs., $1,490 — Same as Group 2 except Sunair S5-DTR replaces Omnigator.

Group 2F, 21 lbs., $1,095 — Same as Group 2 except Wright Executive 60 replaces Narco Omnigator.

(All radio installations include cabin speaker, microphone, headphones and antennas. Three-way transmitter selector switch installed when two or more radios with transmitters are ordered.)

Group 3, 8 lbs., $400 — Turn and bank, rate of climb, sensitive altimeter, clock, outside air temperature, sun

1959 Cessna Skylane-182-180 Series

Factory Data

	Skylane	182	180	180 On Floats
Price	$17,095	$14,600	$14,250	
Continental Engine Model	O-470-L	O-470-L	O-470-K	O-470-K
Power, hp. @ rpm.	230 @ 2,600	230 @ 2,600	230 @ 2,600	230 @ 2,600
Speed—				
Maximum, sea level	170	167	170	149
Max. Recommended Cr. @ 70% hp. at 8,000 ft.	160	157	160	146
Range, 70% hp. @ 8,000 ft., 55 gals.—				
Miles	675	660	675	615
Hours	4.2	4.2	4.2	4.2
True Air Speed, mph.	160	157	160	146
Maximum Range, 10,000 ft., no reserve—				
Miles	845	835	845	820
Hours	7.1	7.1	7.1	7.4
True Air Speed, mph.	120	118	120	110
Rate of Climb, fpm.	1,030	1,030	1,130	1,070
Service Ceiling, ft.	19,800	19,800	21,500	17,000
Fuel Cap. (55 gals. useable), gals.	65	65	65	65
Baggage Cap., lbs.	120	120	120	120
Gross Weight, lbs.	2,650	2,650	2,650	2,820
Empty Weight, lbs.	1,594	1,532	1,554	1,822
Useful Load, lbs.	1,056	1,118	1,096	998
Wing Area, sq. ft.	175	175	175	175
Wing Loading, lbs.-sq. ft.	15.1	15.1	15.1	16.1
Power Loading, lbs.-hp.	11.5	11.5	11.5	12.2
Span, ft.	36	36	36	36
Length, ft.	26	26	26	26
Height, ft.-ins.	9-9	9-9	7-6	12

NOTES: All performance is for gross weight at sea level unless noted. No factory float installation or price.

visors, cabin speaker and low-frequency antenna and mast.

Cessna's "middle line" netted the firm over 1,000 unit sales during 1958 — over 800 of them were Skylanes and Model 182's, less than 200 being Model 180's. Since they have been in production, Cessna has delivered over 3,400 Model 180's and over 2,750 Model 182's and Skylanes. The Skylane is the equivalent of a fully-equipped Model 182 and has proved popular since its introduction to the market, many buyers preferring a "ready-to-go" airplane to one which calls for later equipment installations.

VISULATOR REALISM

(Continued from page 32)

poration in conjunction with C-W engineers which has to be of such miniature physical dimensions as to permit the use of very small three-dimensional models. A model which measures only 12 to 8 feet covers a total area of over ten square miles.

Presentation of a panoramic view on a screen 15 by 26 feet which, in brightness and contrast, compares favorably with the better motion picture projection systems. This required the development of a high speed, f/.97, wide angle refractive-type projection lens.

First production model of the Visulator will be delivered to the Federal Aviation Agency. It will be used to familiarize the FAA staff with the Boeing 707 transport's flight, handling characteristics and crew requirements.

The Visulator with its panoramic non-programmed view, was designed as an integral part of an over-all flight training program. Visulation, when added to all the other elements of modern Curtiss-Wright Dehmel Electronic Flight Simulator, provides sight —the most important of all human senses.—G. E. H.

He Commutes By Air To Beat L. A. Traffic

By MICKEY PARR

BACK in 1916, two young men in Los Angeles vented their enthusiasm for America's pioneer flying spirit by building and flying their own 1910 model Curtiss pusher plane. Today, one of those adventuresome partners, Louis Bartholomew (right), proudly maintains that same enthusiasm at the age of 64 while "pioneering" an aerial commuter's trail that is his personal solution to freeway-jammed automobile traffic, plaguing Southern California motorists.

Each morning, Lou revs up his little 85-h.p. Emigh Trojan and takes off from Fullerton (Cal.) Municipal Airport for Los Angeles International Airport, where he works in the customer service department of the Garrett Corporation's AiResearch Aviation Service Division.

Although his home in East Los Angeles is just 17 miles from AiResearch, it takes about 1 hour and 40 minutes to make the journey by car in the company of thousands of other freeway drivers. Lou shaves some 55 minutes from that time by driving an unimpeded 22 miles to Fullerton airport, hopping into his Trojan and winging 30 air miles to his job.

Cost of this dual mode of travel is no problem to the ageless pilot, since he relishes any opportunity to indulge in his favorite hobby of flying and he claims better gas and oil mileage from his plane than from his car.

Of course, he has an unusual advantage in being able to taxi onto AiResearch Aviation's own ramp and literally step out of the plane into his work.

In ten years of this ground-aerial commuting, Lou has made over 2,000 landings at L. A. International. He began while an airport employe of the City of Los Angeles and continued after transferring to AiResearch. Since he makes it a point not to fly in bad or marginal weather, he has experienced only five or six occasions when he couldn't make the flight back to Fullerton. Though a lifelong bachelor, he always manages to find a way home with a ride in another car or by taking a bus, and has never been "stuck" overnight.

Lou is proud of the fact that his pilot's license, obtained in 1929, has the relatively low number 8864. He has logged over 5,000 hours of stick time, boasts a commercial and instructor's license and during World War II was an instructor for fledgling service pilots in the War Training Service program. Possessing his own plane has been a standard asset for the veteran airman since 1930. A variety of craft have come under Lou's ownership, including a Waco, Piper Cubs and the Emigh Trojan.

Two incidents stand out in the AiResearch employee's memory of his flying experiences. One was the loss of a windshield in flight. Recently, he had the proud distinction of giving his late mother her first flight at the age of 88 years. Mrs. Bartholomew disliked flying and worried about her air-minded son throughout his years of addiction to the sky. That is, until the day that Lou wanted to fly over the grave of a deceased brother.

Mom planned to wait in the car at the airport until the flight was over. However, while warming up the Trojan, Lou turned to discover she had come over to the aircraft. Taking quick advantage of the situation, he invited her aboard and in that instant half a lifetime of resistance to flight was dissipated. ★ ★ ★

NEW BENDIX LINE

(Continued from page 25)

Modularization is not adapted just for the sake of modularization—the technique of designing functions (power supply, i-f, r-f, etc.) into separate plug-in chassis, or cards, that can be separately tested.

The sub-assembly concept is obvious as you go down the assembly lines. The most impressive aspect of the 21 series is the compactness of the separate units while increasing accessibility for servicing and maintenance —a couple of screws removed and *voila!*—the entire set is open for checking or parts removal. Here, too, they are getting away from tuning cranks and old-fashioned antennas, much to the joy of the average pilot as the engineered-in simplicity and availability of the inner workings are a joy to the service man.

We have never been one of those unrealistic and totally unhappy persons who are always complaining about relatively or seemingly high cost of aircraft and all things associated with them. We were fortunate to have learned at an early age that this was an engineering business instead of a mass-production industry. You get the very definite impression that Bendix Radio has always and is now basically an engineering organization. You go through the factory and pick up a little gold-plated switch on a printed circuit mounted on a piece of green plastic with no soldering. Then, when you check into the beginnings of this little gadget, weighing about an ounce, trace it through design stages, testing, modification, further testing, finally into production, shake-down tests, heat and cold tests, destruction tests and final installation into the commercial product ready for the market, you wonder how our American aircraft radio manufacturers can turn out such miraculous and dependable equipment at so low a cost to the relatively few buyers.

As in all the other radio factories we have recently visited there's a real spirit of dedication in the Bendix Radio plant. They are radio people, yes, but they are also aviation people. Every sales engineer serving the business aircraft market is an experienced pilot. They know that human life depends upon the equipment they build. They put their own equipment in their own airplanes and fly the socks off it in all kinds of climes and under all sorts of conditions from dust to snow and from high humidity to blazing heat. Two twin-engine aircraft are in constant use by the Baltimore plant, a Cessna 310 and a D-18 Beech.

Clarence I. Rice is manager of the Aviation Electronic Products Division with Hersh Wolf as sales manager. George W. Church, former engineering manager, recently became assistant manager of the aviation department. Chuck O. McAtee is business aviation senior sales engineer; A. J. (Pete) Rogers is service manager, and Don G. Erskine is advertising manager, all in Hersh Wolf's department. E. D. Hart, former systems and planning manager, is engineering manager.

Bendix boasts 33 dealers, all located on well-known airports throughout the country and all equipped with fine shops staffed by competent radio mechanics, although some of them are not yet equipped to service airborne radar. According to Hersh Wolf, however, this gap is finally closing through the use of a fine factory service training course.

Bendix Radio factory-authorized agencies are as follows:

Arizona: Aero Electronics, Inc., 2402 Airline Way, Sky Harbor, Phoenix, Arizona.

California: AiResearch Aviation Service Co., 6201 West Imperial Highway, Los Angeles, California; Bayaire Avionics, Inc., Oakland Airport, Oakland, California; Qualitron, Inc., Lockheed Air Terminal, Burbank, California; Southern California Aircraft Corp., Ontario International Airport, Ontario, California.

Colorado: Aircraft Radio & Accessory Co., Hangar No. 4, Stapleton Field, Denver, Colorado.

District of Columbia: Butler Aviation, Washington National Airport, Washington, D. C.

Delaware: Atlantic Aviation Service, Inc., P. O. Box 1709, New Castle County Airport, Wilmington, Delaware.

Florida: L. B. Smith Aircraft Corp., P. O. Box 456, International Airport, Miami, Florida.

Georgia: Southern Airways Company, Atlanta Airport, Atlanta, Georgia.

Illinois: Butler Aviation, 4848 W. 63rd St., Midway Airport, Chicago, Illinois; Capitol Aviation, Inc., Capital Airport, Springfield, Illinois; Skymotive, Inc., O'Hare Field, Chicago Int'l Airport, P. O. Box 448, Park Ridge, Illinois.

Michigan: Anderson Aircraft Radio Co., Detroit City Airport, Detroit 5, Michigan; Robbins Aviation Corp., Pontiac Municipal Airport, Michigan.

Minnesota: Minnesota Airmotive, Inc., Wold Chamberlain Field, Minneapolis 23, Minnesota.

Missouri: Remmert-Werner, Inc., Lambert Field, St. Louis, Missouri.

New Jersey: Atlantic Aviation Corp., Teterboro Air Terminal, Teterboro, New Jersey; Smith Meeker Engineering Co., Teterboro Airport, Teterboro, New Jersey.

New York: Airmar Radio Service, Inc., MacArthur Airport, Ronkonkoma, L. I., New York; Buffalo Aeronautical Corp., Buffalo Airport, Buffalo 25, New York; Butler Aviation, LaGuardia Airport, New York, N. Y.; Page Airways, Inc., Rochester Municipal Airport, Rochester 11, N. Y.; Smith Meeker Engineering Co., Westchester County Airport, White Plains, New York.

Ohio: Chamberlain Aviation, Inc., Municipal Airport, Akron, Ohio; Ohio Aviation Co., P. O. Box 305, Vandalia, Ohio.

Oklahoma: Tulsair Distributors, Inc., Hangar 8, Municipal Airport, Tulsa, Oklahoma.

Pennsylvania: Beckett Aviation Company, Allegheny County Airport, Pittsburgh, Pennsylvania; Reading Aviation Service, Inc., Municipal Airport, Box 1201, Reading, Pennsylvania.

Texas: Allied Instrument Lab., 8238 Travelair, International Airport, Houston 17, Texas; Dallas Aero Service, 3300 Love Field Drive, Dallas 9, Texas; Executive Aircraft Electronics, Inc., Red Bird Airport, Dallas, Texas; Howard Aero Service, Inc., International Airport, San Antonio, Texas.

Watch Your Sink Rate

EDITOR:

In the article, "Private Design With Novel Features" (Dec., 1958), the statement is made that "a true stall can not be obtained . . . because the airplane just mushes along retaining full aileron control."

I understand the author's feeling, but there's a dangerous error, academically and flight-wise. A stall by definition occurs when an aircraft is flown at an angle of attack greater than the angle of attack for maximum lift. Sink rate is the dangerous product, as is the "backside" of the power curve (or area of reverse command). Aileron control is a relative feature of the problems encountered when operating a stalled aircraft. It is important, but only enables one ultimately to crash with wings level rather than in some other manner. Its best application is probably in recovering from a post-stall gyration.

These comments are advanced from a safety standpoint.

—OLIVER J. SEMMES III,
4957 Springhill Drive,
Pensacola, Florida.

PIPER

The World's Leading Builder of Agricultural Aircraft

The Piper PA-18-A, world's most widely purchased agricultural airplane, is equipped at the factory with spray and dust equipment engineered for effective and economical dispersal of chemicals.

Experienced operators the world over choose the PA-18-A for the efficient performance, unmatched reliability and low costs that add up to profitable operations.

The PA-18-A combines terrific load-carrying capacity with the ability to land and take off safely in minimum space, close to each individual job. Solid or liquid chemicals are conveniently loaded in shortest possible time, and dispersed in precise, rigidly controlled patterns.

Powered by a dependable 150 horsepower Lycoming engine, the PA-18-A is available either as a sprayer (with 110-gallon tank capacity), duster (with hopper capacity of 18 cubic feet) or as a combination unit, quickly interchangeable.

Study the facts, features and figures—and see for yourself why PA-18-A performance is unsurpassed, especially where fields are short and there's a premium on precision.

SEND FOR DETAILS.
New brochure on 1959 PA-18-A now available. Write Dept. F-13.

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AIRCRAFT CORPORATION
Lock Haven, Pennsylvania

HIGH-LIFT FLAPS permit PA-18-A, fully loaded, to take off in 100 yards, reduce landing roll to less than 140 yards. With flaps extended, PA-18-A lands at 45 miles an hour. Partial flap enhances down-wash in dusting operations.

LOADING IS EASY and uncomplicated through hatch on flat top deck with metal reinforcement. Large air scoop keeps solid chemicals from caking. Convenient baggage compartment has separate door on right side of fuselage.

"FLOATING" SPRAY BOOMS are hinged to swing back if they come in contact with ground objects. Nozzles, rigged for application at rates from one-half to 15 gallons per acre, are self-closing. Positive action of cockpit lever assures complete shut-off of spray with no drip.

SPRAYER PUMP is heavy duty centrifugal type. Pressure system incorporates by-pass lines to agitate liquid chemicals for uniform mixture. Load can be dumped in seven seconds in emergency.

PA-18-A DUSTER has gross weight of 2,070 pounds, payload of 1,010 pounds with standard equipment. Hopper capacity is 18 cubic feet. Wind-driven double agitator assures uniform flow of dust into venturi dispersal unit. Dust is dispersed in effective maximum swath of 70 feet, working swath of 50 feet.

SIX-FOOT VENTURI, fed through double throat, lays 70-foot swath—50-foot working swath—with excellent downward penetration. Aerodynamically correct openings are designed to counteract spiral slip stream..

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Municipal Airport
El Paso and Lubbock, Texas

Clinton Aviation Company
Stapleton Airfield
Denver, Colorado

Cruse Aviation, Inc.
International Airport
and Clover Field Airport
Houston, Texas

Dal-Tex Aviation, Inc.
Addison Airport
Addison, Texas (Dallas)

Poelman Aircraft Co.
New Orleans Airport
New Orleans, Louisiana

Ragsdale Flying Service
Municipal Airport
Austin, Texas

Kenneth Starnes Aviation Service
Adams Field
Little Rock, Arkansas

Southwestern Skyways, Inc.
Municipal Airport
Santa Fe, New Mexico
and Ogden, Utah

Sunny South Aircraft Service, Inc.
Broward International Airport
Fort Lauderdale, Florida

Walston Aviation, Inc.
Civic Memorial Airport
East Alton, Illinois

Yingling Aircraft, Inc.
Municipal Airport
Wichita, Kansas

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YOURS FOR 1959: the new "Power-Geared" Cessna 175 . . . with its extraordinary power and performance proved by a year's outstanding service—and available for just $11,250 (with std. equip., f.a.f. Wichita). Here's what you get with the new, 4-place, all-metal 175:

OUTSTANDING POWER: The smooth, 6-cylinder Continental engine is "Power-Geared" to deliver *175 horsepower* . . . boosts speed to 147 m.p.h.!

TOP PERFORMANCE: Cessna's High-Stability Wing assures you big-airplane performance. For short landings, Para-Lift flaps float you down twice as slowly as a parachute! Cessna Land-O-Matic gives effort-free take-offs and landings. (Also approved for floats and skis.)

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AND MANY MORE big-airplane features make the Cessna 175 your best value-packed buy. See it today! Call your Cessna dealer now (Yellow Pages of phone book). Look at all *seven* great Cessna models. Also ask him about lease plans. Or write: Cessna Aircraft Company, Dept. FM-5, Wichita, Kansas.

HELICOPTER OPERATORS

(Continued from page 42)

copter costs, suggesting that manufacturers take the initiative in arranging three to four meetings yearly with operator groups to discuss technical and general business problems. The military could help by insisting that manufacturers produce helicopters for less and reduce overhead when letting large production orders. Further criticizing the manufacturing industry, Suggs said he believes manufacturers should sell to established operators and help them sell their services rather than overcrowd fields where too many operators already exist. His estimates of current commercial helicopter operating business exceeded those of Eccles — Suggs said he believes there are nearly 300 operators today operating nearly 1,000 commercial copters, estimating they are grossing about $50,000,000 a year and declaring this is more than the manufacturers gross from sale of their helicopters.

Some figures distributed at the meeting by the Aircraft Industries Association indicate there were 129 U. S. and Canadian commercial operators using 535 helicopters as of January, 1959. Actually, there are probably 150-200 more helicopters and perhaps 20 to 30 more operators than the AIA figures indicate, but they are valuable because they provide a breakdown of commercial copters by type and the ratio is a dependable index. It follows: 400 Bells, 78 Sikorskys, 26 Hillers, 21 Vertols, 5 Republic Alouettes, 3 Kamans and 2 British Westlands.

Manufacturers attending the HAA meeting made interesting reports and staged demonstrations. Hiller was the host manufacturer. The convention was saddened by the death of Fred Roscoe, Bell domestic commercial sales manager, in an accident en route to the meeting. Formerly with Cessna Aircraft, Roscoe had many industry friends.

The Association elected officers as follows: President — J. C. (Cully) Weadock, Chesapeake and Potomac Airways, Baltimore; vice presidents — Alfred Stringer, Okanagan Helicopters, Vancouver, B. C., Canada, and Bill Cowan, Southwest Helicopters, Los Angeles; secretary — Hal Conners, Helicopter Air Lift, Chicago; treasurer — Gil Ervin, Hawk Helicopters, Fort Worth. The Association plans soon to hire a professional executive for the first time.

Roped on an Alouette (above) and flown (below) to a construction site, this steel conduit section weighed 496 lbs.

Alouette Proved in Mountain Work

DOING the difficult is routine work for helicopters and the new turbine-powered Alouette II marketed by Republic Aviation proved its work capabilities on hauling jobs recently in California's difficult Sierra Nevada mountains.

Operated by Aetna Helicopters of Etna, California, as the first Alouette in America, its recent jobs included airlifting 9,000 lbs. of steel conduit and supplies in 2 hrs. 12 mins. to a water measurement station; flying 25,000 lbs. of lumber, cement, prefabricated wall and roof sections and furnishings for a new fire lookout station near the top of 10,400-ft. Mount Mitchell; carrying firefighters and supplies in combatting forest fires, and conducting aerial spraying in a 100-acre patch of blight-infested pine 9,400 ft. above sea level. Heaviest loads on any single flight were 1,200-lb. cargos of pipe and gear.

The Alouette II is the first shaft-turbine-powered commercial helicopter on the market. It was developed in France and is sold in America by Republic Aviation. With 5 seats and a 1,400-lb. useful load at a 3,300-lb. gross weight, it is powered by a 400-hp. turbine and has a fuel capacity of 153 gals. Price is $88,650.

Airmen's Calendar

Feb. 21-22—13th Annual Pacific Coast Mid-Winter Soaring Championship, Torrey Pines, San Diego, Calif.

Feb. 22-24—8th Annual Texas Agricultural Aviation Conference, Texas A & M College, College Station, Texas.

March 3-6 — Agricultural Aircraft Pilots and Operators Short Course, University of California, Davis, Calif.

March 8-11—4th Annual Gas Turbine Conference and Exhibit, American Society of Mechanical Engineers, Netherland-Hilton Hotel, Cincinnati, Ohio.

March 29—Flying Physicians Association Tour to Mazatlan, Mexico. Contact Dr. C. M. Starr, 10866 Riverside Dr., North Hollywood, Calif.

March 31-April 3—National Aeronautic Meeting, Society of Automotive Engineers, Hotel Commodore, New York.

April 12-15—American Association of Airport Executives Annual Meeting, Savannah, Ga.

April 12-19—World Congress of Flight, Air Force Association, Las Vegas, Nevada.

April 30-May 1—Aircraft Electronics Association Annual Meeting, McAllister Hotel, Miami, Fla.

May 4-7—5th Annual Flight Test Instrumentation Symposium, Instrument Society of America, Olympic Hotel, Seattle, Wash.

May 20-22—2nd Annual Jet Age Airport Conference, ASCE, Shamrock Hilton Hotel, Houston, Texas.

May 26-28 — Supersonic Transport Meeting, San Diego Section, Institute of Aeronautical Sciences, San Diego, Calif.

June 23-25—33rd Aircraft Distributors and Manufacturers Assn. Meeting, St. Francis Hotel, San Francisco, Calif.

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ROY R. TAYLOR
President

(Continued from page 8)

eral Aviation Facilities Planning Group following its recent reorganization. New chairman is Joseph B. Burns, president of the National Business Aircraft Association. Joseph T. Geuting, Jr., representing the Utility Airplane Council of the Aircraft Industries Association, is secretary-treasurer. Members of a 5-man steering committee, with Burns and Dr. Leslie A. Bryan, director of the University of Illinois Institute of Aviation and past chairman of GAFPG, are Joseph B. Hartranft, Jr., president of AOPA; A. Biederman, president of National Aviation Trades Association, and James R. Kerr, chairman of AIA's Utility Airplane Council. The General Aviation Council is a voluntary association of eleven aviation organizations. One of them, the American Association of Airport Executives, is withdrawing, its directors taking the position that the airport managers group is "equally concerned with all segments of the industry including general aviation, scheduled airlines and military tenants" and therefore should be in a position "to deal directly and independently" with the administrator of the FAA and other government agencies.

Civilian planes and instructors are teaching hundreds of college ROTC students to fly at 140 schools. These scenes show some of the activities at Texas A & M College.

92 in Flight Training At Texas A & M

UNDERGRADUATE ROTC flight training is stimulating interest in flying at 140 universities and colleges in a four-year program initiated in 1957. Largest participation is at Texas A & M College, Bryan, Texas. A total of 92 students, of which 72 are Air Force and 25 Army ROTC students — enrolled for the 1958-59 school year.

Each student receives 36.5 hours of flight training by civilian instructors from White Rock School of Aviation of Dallas, operated by John H. Huett. Training is in single-engine Cessnas on the students' own time. It is sufficient to qualify the student for a private pilot's license and he must take an FAA check ride and examination to determine if he is qualified for military training.

First objective is to motivate Army and Air Force cadets to a career in military aviation. This motivation is needed on a large scale to meet modern military aviation demands for cadets. About 85% of the Army and Air Force's pilots are drawn from such programs. Civilian contract schools provide the college training at lowest possible costs. The program at Texas A & M, for example, costs the military only about $450 for each student. Applicants are thoroughly screened in their junior year. In the flight program last year, the AF-ROTC section washed out seven students. The Army's experience is similar. Weeding out is not the purpose of the college program but it will have the effect of reducing the washouts in military training when ROTC students enter military training.

Doyle Alexander, chief pilot for White Rock's staff at A & M, said students are not required to obtain a private license but "it's my ambition to qualify each student for a private ticket." Most obtain the license.

"This civilian training for future military student pilots will increase the awareness of civil and military problems," comments John Huett, whose school conducts the training at A & M. "But that is secondary to the fact that a nationwide college flight program stimulates an interest in flying in general. Our strength lies in an air-minded public with many people trained to fly."

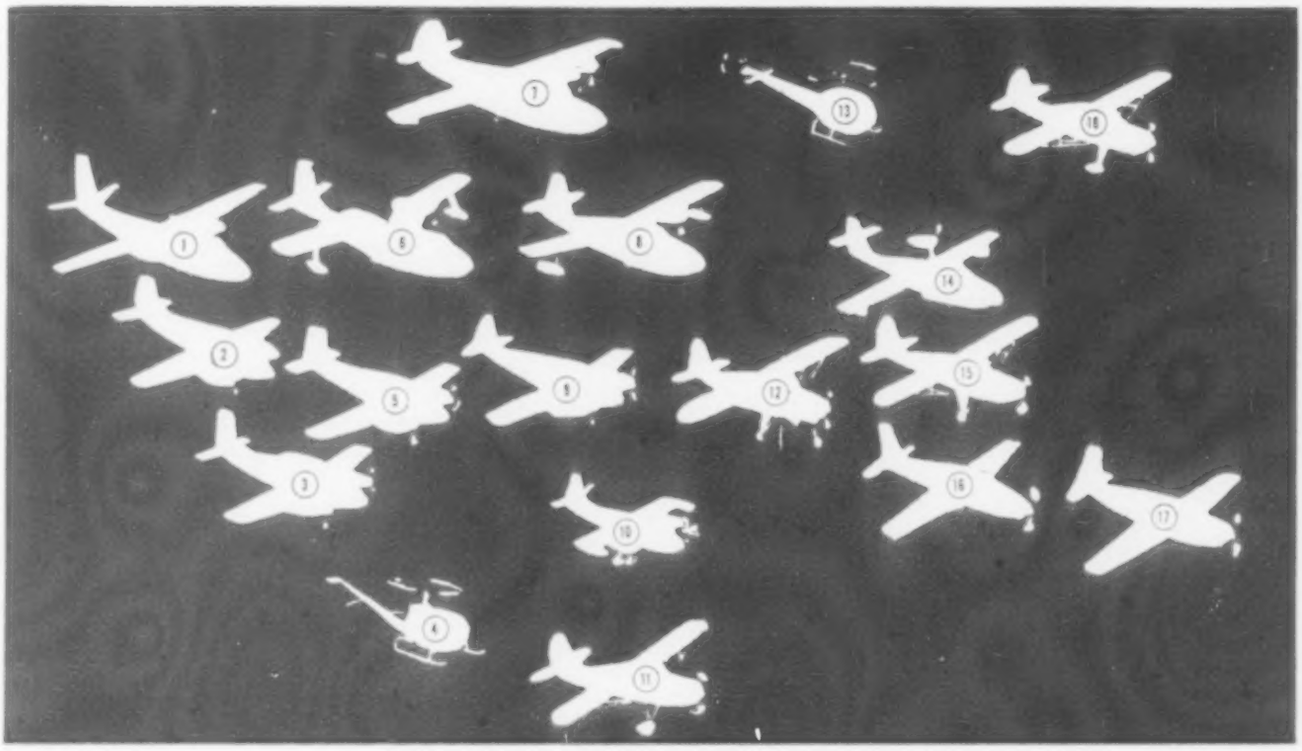
OVER 75,000 STUDENT PILOT CERTIFICATES were issued during 1957, compared to 45,036 issued in 1956, according to the 1958 edition of the Statistical Handbook of Civil Aviation, placed on sale last month at 55 cents per copy by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. This standard reference source outlines civil aviation's growth in over 120 pages of tables and graphs.

FOUR COMMERCIAL SIKORSKY HELICOPTERS were delivered last month to individual customers in the U. S., Canada and Italy. Purchasers included Okanagan Helicopters, Ltd., Vancouver, B. C., which received its 22nd S-55; the State of Pennsylvania, which received a Sikorsky reconditioned surplus S-51 for use in civil defense and emergency work; and Agip Mineraria of Milan, Italy, which operates helicopters for the oil industry in the Near East and took delivery of a new S-58.

LOCKHEED AIRCRAFT PRODUCED ITS 50TH PROPJET ELECTRA AIRLINER in February with production nearing a peak rate of 9.5 Electras per month at Burbank. The factory said a 52,000-mile world tour by an Electra demonstrator proved the new airliner meets or exceeds certificated figures for performance. Herman R. (Fish) Salmon, chief engineering flight test pilot, took the Electra on the tour.

AIRMAN EXAMINING AGENCY CERTIFICATE NO. 1 has been issued by the Federal Aviation Agency to the University of Illinois Institute of Aviation, making it the nation's first flight school authorized to award pilot licenses on the basis of examinations given by its own staff. Last year, 185 students earned private pilot licenses and 30 earned commercial pilot licenses at the school, which has its own airport and operates 40 airplanes with Jesse W. Stonecipher as chief flight instructor.

If you own or operate one of these aircraft . . .



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9. Piper Apache
10. Robertson VTOL
11. Champion DXer
12. Piper TriPacer
13. Bell Helicopters
14. Colonial Skimmer
15. Piper Super Cub
16. Piper Comanche
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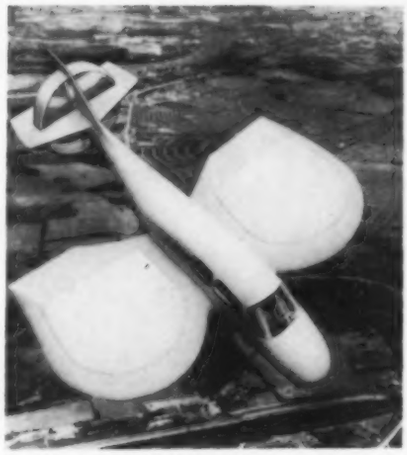
FRED L. ROSCOE, commercial domestic sales manager of Bell Helicopter Corp., was killed on Jan. 13 in a copter accident near Santa Rosa, N. M. Roscoe had joined Bell in August, 1957. He was 35 and was formerly domestic sales manager for Cessna Aircraft Company at Wichita.

FLYING PLATFORM DEVELOPED BY CHRYSLER CORPORATION FOR THE ARMY is in final stages of construction at Detroit and is scheduled for tie-down and hovering tests following completion this spring. The wingless, 21 by 10-ft. flying jeep obtains lift from two ducted propellers driven by a standard 6-cylinder engine. Vanes which vector the air are used for control. John V. Gorton, project manager, said the craft shows promise of a substantial reduction in manufacturing and maintenance costs as compared to any other vehicle of its type.

FIRST MANNED SPACE CAPSULE FOR ORBITAL FLIGHT will be built by McDonnell Aircraft Corp., St. Louis, winner of a design competition among twelve companies. Complete electronic instrumentation for the capsule will be developed by Collins Radio Company and will include radio voice communications, radio command system for control of the capsule, a telemetry system, a guidance system to put the capsule into orbit and to assist in guiding it back to earth, a tracking system to follow its orbit and a rescue radio beacon system for locating it when it lands. Known as "Project Mercury," the manned capsule is to be fired into orbit by an ICBM rocket booster.

AIR CRUISE TO MEXICO will be conducted Feb. 22-March 5 by the Florida Aero Club and will start from New Orleans and include stops at Galveston, Monterrey, Guadalajara, Mexico City and Acapulco. Private pilots are welcome. Package price of $212 double or $240 single includes hotels, meals and ground transportation. Details are available from Harry B. Collins, 375 NE 154th St., North Miami Beach 62, Florida.



VTOL BUSINESS PLANE which could revolutionize commercial and private flying is aim of this design under construction and soon to be flown by Vanguard Air and Marine Corp., operators of Valley Forge Airport and Flying Service, Audobon, Pa. Each wing and tail have shrouded propellers. In cruise flight, wing closures convert wing to conventional surface for speed. VTOL craft would use heliports and small clearings instead of airports but cruise at high speed. Edward G. Vanderlip and John J. Schneider, who designed the place, were formerly with Piasecki Aircraft, helicopter manufacturers.

TWO FEDERAL AVIATION AGENCY APPOINTMENTS announced last month by Administrator E. R. Quesada were J. Gordon Bennett as special assistant to the Administrator, and Brig. Gen. George S. Cassady as deputy director of the Bureau of Air Traffic Management. Bennett was the government member and staff director of the Harding Group in 1955, which urged the agency's creation, and was special assistant to Edward P. Curtis, who recommended FAA's basic organization to the president. He has since been serving as Quesada's chief advisor in the White House. General Cassady has been deputy commander of the Eastern Transport Air Force, MATS.

NORTHROP CORPORATION is the new name of Northrop Aircraft, Inc., and its division at Hawthorne, California, is now known as Norair. Other divisions are Radioplane, Nortronics and International.

ANNUAL AWARD FOR RADIO AIR RESCUES has been established by Nova-Tech, Inc., Manhattan Beach, Calif., with "the man behind the mike" to be selected each year from entries submitted by pilots throughout the country for the most outstanding assistance given a pilot in distress by a radio operator. The new radio communicators award is open to all tower, airways or GCA operators and smaller airport operators who use Unicom equipment and the winner will receive a $200 savings bond and a bronze plaque, with the pilot submitting the winning information receiving a $50 bond. "We want to know about it whenever a ground-based radio operator helps a pilot out of a dangerous situation," said Sidney Held, president of the firm. Entries should be mailed to him at Nova-Tech, Inc., 1721 Sepulveda Boulevard, Manhattan Beach, California. The firm manufactures a 4-lb. TR-102 VHF transceiver for lightplanes.

LAST CONVAIR B-36 BOMBER BUILT will become a permanent display at Amon Carter Airport at Ft. Worth.

LANDING FEES FOR ALL ITINERANT AIRCRAFT will be charged by Detroit Metropolitan Wayne County Airport effective March 1. The schedule of fees for private aircraft, as posted by Airport Manager Joseph W. Gross, is as follows, with commercial aircraft fees in parenthesis: Aircraft grossing 0 to 3,000 lbs., $1 ($1); 3,000 to 7,500 lbs., $1.50 ($2); 7,500 to 12,500 lbs., $2 ($4); 12,500 to 20,000 lbs., $3.25 ($6.50); 20,000 to 30,000 lbs., $5 ($10); 30,000 to 50,000 lbs., $8 ($16), with a top charge of $25 and $50 for aircraft grossing 125,000 lbs. and over. Payment includes free parking for 8 hours, with parking for each succeeding 24 hrs. at the same rate as the landing fee.

FIRST TURBINE-POWERED HELICOPTER TO COMPLETE THE ARMY'S ACCELERATED 1,000-HOUR FLIGHT TEST is the Bell YH-40, being produced as the HU-1 and powered by an 845-hp. Lycoming T-53 turbine. Conducted at Ft. Rucker, Alabama, by the Army's Transportation Aircraft Test and Support Activity, the YH-40 Iroquois was kept in the air 10 to 12 hours daily, seven days weekly, with maintenance performed at night. Operational experience normally requiring three to five years of time was thus acquired in only a few months, said Lt. Col. Charles E. Hollis, in charge.

MORE CONTRACT MAINTENANCE FOR ARMY AVIATION is expected during the coming year. The Army contracts for practically all of its aircraft maintenance.

Business Flight Safety Award Nominations Wanted

MAY 1 is the deadline for nominations of individuals in the industry who have most effectively carried out and promoted business flying safety. The award, presented by the National Business Aircraft Association at its annual meetings, was founded by the Women's Aeronautical Association of Kansas, P. O. Box 1676, Wichita, Kansas, from which nomination blanks may be obtained. It carries with it a beautiful WAA Business Flight Safety Trophy of sterling silver with a cup lined with 24K gold. Completely worked by hand, a new and identical cup is made each year. It was designed and is executed by Rudolph Brom, international silversmith.

Nominations are solicited from industry and the NBAA and should describe the nominee's accomplishments in the interests of business flying safety in five hundred words or less with whatever substantiating evidence may be appropriate. The first award in 1955 went to John P. Gaty, Beech Aircraft vice president and general manager for his flight safety accomplishments including the booklet "Kinetikos." The 1956 award went to Jesse W. Stonecipher, University of Illinois chief flight instructor, for originating the 180-degree turn procedure and other work. The 1957 award went to C. E. A. Brown, Ohio's state aviation director, for his sponsorship of the Flying Green Cross safety program.

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GRUMMAN PROPJET GULFSTREAM PROGRAM is rolling along with three of the executive transports pictured above in various stages of development at Grumman's facility at Bethpage, Long Island, New York. Those in foreground and background are undergoing extensive flight testing for FAA certification while Gulfstream No. 3 (right) nears completion. The twin propjet will carry 10 to 19 passengers 350 mph. at normal cruising altitude of 25,000 ft. and operate from runways under 4,000 ft. long. Twenty-seven corporate Gulfstreams are on order.

—(Grumman Photo.)

NATIONWIDE ROUNDUP:

New Business In the Hangar

MORE THAN 50 SERVICE COMPANIES DEVOTED TO BUSINESS AIRCRAFT ELECTRONIC INSTALLATIONS AND REPAIR are now members of the Aircraft Electronics Association, according to Charles O. Peacock of Aircraft Radio & Accessory Co., Stapleton Airfield, Denver, and president of AEA. This network makes available to aircraft owners a professional corps of servicemen in approved shops from coast to coast for the selection, sales, servicing, maintenance and overhaul of all types of aircraft electronics. AEA is a trade association having among its goals the advancement of the science of aircraft electronics, aid in establishing uniform performance standards and assistance in the maintenance of proper licensing procedures. The group's annual meeting will be held April 30 in Miami at the McAllister Hotel. Full details are available from Charles Peacock, Aircraft Radio & Accessory Co., Stapleton Airfield, Denver 7, Colorado.

Victoria propjet for 48 passengers would use new-manufactured and pressurized Martin 404 fuselage with forward cargo door and new high-lift wing with four Lycoming T55 turbines rated at about 2,000 hp. each.

Propjet Design for Latin America

EMILE Gilutin and Associates, Inc., 8915 Gaston Parkway, Dallas, has announced a design project for a high-performance 48-passenger turboprop commercial transport utilizing four Lycoming T55 turbines of about 2,000 hp. each, a new high-lift wing, and new-manufactured Martin 404 fuselage. It was designed for Latin American operations from small airports and from airports at high elevations above sea level.

Gilutin said the design is the result of several years of engineering based on requirements from Latin American airlines, three of which have issued letters of intent for the possible purchase of eleven airplanes. Production would depend on further orders being obtained and the airplane would be produced in San Jose, Costa Rica, by SALA. Low-cost production is a feature of the project with a price of $500,000 to $600,000 as the target.

Known as the "Victoria Model 101," the design has a 45,000-lb. take-off gross weight; 43,000-lb. maximum landing weight; 10,000-lb. payload; normal fuel capacity of 1,500 gals. but tank capacity for over 3,000 gals. when needed; 79-ft. span with 1,050-sq. ft. wing area; cruising speed in excess of 300-mph.; less than 3,000-ft. runway requirement at sea level, less than 5,000-ft. runway requirement at Mexico City and Bogota and 7,000-ft. runway requirement at La Paz, elevation over 13,000 ft. Double-slotted flaps and wing spoilers are used.

EXECUTIVE AIRCRAFT SERVICE, Redbird Airport, Dallas, has installed flush-mounted Jatos in the nacelles, aileron gap closure, wing inspection and cabin and other work on Don Beeler's Delhi-Taylor Oil DC-3. . . . In for routine work were the following: Stein Lee's Gulf Oil Lodestar; Kay Hodge with Odessa Natural Gasoline Company's Lodestar; Leonard Smith's Western Pipe Line Lodestar and Ed Armstrong's S. W. Richardson DC-3.

REMMERT-WERNER, Lambert Field, St. Louis, installed larger, more comfortable and more adjustable cockpit seats in Lou Rinebold's Callery Chemical DC-3. . . . Center section attach angle modifications were performed on Riss & Company's Super 92 DC-3 for Scott McHenry, pilot. . . . Engine change was performed for Hank Gausman and Bob Schurwan on their Fruin-Colnon Contracting Lodestar. . . . Remmert-Werner's Pompano Beach shop in Florida had Olin-Mathieson's DC-3 in for engine change and rudder recover, Bill Heaton and Warren Nelson, pilots.

DALLAS AERO SERVICE, Love Field, Dallas, received two more Lodestars for its complete DAS safety-speed kit modification. One is a second such Lodestar job for D. Harold Byrd, for whom George Mays is chief pilot, and the other is Jimmy Kreel's Rodman Supply Lodestar from Odessa. . . . Annuals were performed for Russ Johnson's American Liberty Oil DC-3 and for Dick Barker's Renwar Oil Lodestar. . . . de Havilland Doves in the shop included Walt Hedrick's Shell Oil Dove from Tulsa, double engine change and miscellaneous work; Bill Eggleston's Shell Pipe Line Dove from Houston, engine change; Wally Tingley's Shell Oil Dove from Midland for engine overhaul and wing inspection; and John Conrad's A. B. Herpolsheimer Dove from Los Angeles for radio installation and double engine change. . . . Complete Bendix and ARC radio installation is being made in a 680 Aero Commander for Brown Aero.

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- Logan International Airport
  East Boston, Massachusetts
- International Airport
  Philadelphia, Pennsylvania
- New Castle County Airport
  Wilmington, Delaware

BUTLER CO., AVIATION DIVISION
Midway Airport, Chicago, Ill.

CURREY SANDERS AIRCRAFT CO., INC.
Downtown Municipal Airport, Shreveport, La.

CUTTER-CARR FLYING SERVICE, INC.
West Mesa Airport, Albuquerque, New Mexico

GRAY AIRCRAFT SVC. CO., INC.
D. A. Cody, Service Manager
Love Field, Dallas, Texas

GREENSBORO-HIGH POINT AIR SERVICE, INC.
Greensboro-High Point Airport
Greensboro, North Carolina

ELLIOTT FLYING SERVICE
- Municipal Airport, Des Moines, Iowa
- Municipal Airport, Davenport, Iowa

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AERO DESIGN & ENGINEERING COMPANY SALES MANAGEMENT APPOINTMENTS FOR INTENSIFIED AERO COMMANDER SALES include E. B. Charles, former commercial sales manager, as general sales manager; Robert Geis, formerly of Beech Aircraft, as domestic sales manager; Tom Sim, formerly with Air Carrier Service Corp., as export sales manager; Jack Rector, formerly with Home State Life Insurance Co., as public relations manager, and Clarence Morgan, former regional sales manager, as director of sales training. The new appointments are to strengthen factory relations with distributors and provide sales assistance to distributors, said Tom Harris, vice president of marketing.

—(Aero Design Photos.)

AIRESEARCH AVIATION SERVICE, Los Angeles International Airport, will construct several buildings with about 8,000 sq. ft. of floor space and about four acres of concrete ramps on a new nine-acre addition to its expanding property bordering Imperial Boulevard. The expansion will be used for fabrication work in aircraft modifications and custom aircraft furniture as well as for housing some of the office staff, according to Harrison Holzapfel, manager. . . . AiResearch is modifying for executive use Burlington Industries' Convair 240 recently acquired from Frederick B. Ayer and Associates. Pilots Shelby Maxwell and Art Ashley are on hand for the work, which includes installation of an executive interior, special soundproofing, outer-panel auxiliary fuel tanks, Bendix RDR-1 weather radar, A-12 autopilot, Janitrol ground heater, auxiliary power unit, increased gross weight, custom painting and relicensing. . . . International Business Machine's Convair 440 was brought in by John Posers and Ken Fuller for miscellaneous radio work and turn-around service. . . . In for interior work and turn-around maintenance was a DC-6C of Hawaiian Air Lines. . . . Vance Breeze brought in his Beech D-18 for painting. . . . An AiResearch conversion kit will be shipped to Eagle Aircraft in England for modification of a Maritime Central Airways of Canada DC-6A cargo ship to a DC-6A/B cargo-passenger configuration. . . . AiResearch is constructing six 3-place berthable divans for use on Boeing 707 jets to be used by the Air Force for executive transportation. . . . Rocky Crane brought in his Big Ben Ranch Super Aero Commander from Midland, Texas, for inspection and annual relicense.

CAL WHITE, formerly of Airmar Radio Service, Inc., MacArthur Field, Idlewild and Newark, has become part owner of West Texas Flying Service at Midland, Texas, and will head up an expanded aircraft electronics shop.

SPARTAN AVIATION SERVICE, Municipal Airport, Tulsa, installed two 50,000-BTU Janitrol heaters in Guy Polston's Service Pipe Line Lodestar, on which the flap track and trailing edge were modified and fuel tanks stripped and resealed. . . . Jim Cleveland was in with Ashland Oil & Refining's Cessna for double engine, prop and accessory overhaul. . . . Two ARN-14 omnis were installed and an engine change performed on Bill Hubbard's H. C. Price Douglas B-23. . . . Extensive modifications and reupholstering were done for Helmerich & Payne's de Havilland Dove while it was in for paint job, engine change and prop overhaul. . . . Ollie Burton stopped in with M. A. Hanna Company's Lockheed PV-1 for

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engine change, paint job and extensive miscellaneous work. . . . Landing gear slide tubes were replaced on K. H. Lane's Panhandle Eastern Pipe Line Beech Super 18. . . . New paint job was applied on Frank Ernst's Franklin Supply de Havilland Dove, which also received aircraft, engine and instrument periodic inspection. . . . Arch Reed was in with his M. A. Hanna Company Beech Super 18 for an engine change and overhaul of all engine accessories and propellers. . . . In for routine work were Bruce Crockett's Pure Oil Lockheed 12 and Harry Horton's Piper Apache.

WILCOX MODEL 714B ATC TRANSPONDERS have been selected by Delta Air Lines as standard for their jet fleet of Douglas DC-8's and Convair 880's. Pan American Airways ordered a substantial quantity of the Wilcox transponders after an extensive "in-service" evaluation with 3 units. Other airlines ordering the unit are Bonanza, Eastern and Trans-World.

PACAERO ENGINEERING CORPORATION, Santa Monica, delivered a Learstar Mark I to Walsh Construction Co., New York, Fred Leslie, chief pilot. . . . Consolidated Western Steel's Lodestar, Bill Cloes, chief pilot, was in for installation of Learstar wheels, brakes and flaptrack modification. . . . Dick Cull's California Standard Lodestar was in for installation of Learstar rudder spring tabs, wheels, brakes and other modifications. . . . Lane Hartwell brought in Essex Wire's Lodestar for rudder spring tabs, elevator spring tabs, radar, radio rewire and miscellaneous work. . . . One of Westinghouse Electric's Learstars was brought in by Bob Nagel for dual engine change and 1,000-hr. inspection. . . . A new paint job was applied on a U. S. Steel DC-3 and service work was performed on one of their Learstars. . . . Al Pinckley, chief pilot, brought in a Marathon Division of American Can Learstar for interior work, inspection and service work.

PIEDMONT AVIATION, Smith Reynolds Airport, Winston-Salem, N. C., performed exhaust stack rework and other work for a Reynolds Tobacco DC-3, Herb Drew, chief pilot. . . . Other DC-3's in the shop included Bill Dameron's Sears, Roebuck, Dave Flannery's Aluminum Company of America, two for Hap Wilson of Management Service, two for Miami Airlines, Warren Larson of Cummins Engine, Ed Haffey of the Corps of Engineers and W. C. Powell of Bell Aircraft.

NORMAN LARSON COMPANY, Van Nuys, California, had Beech modernization kits installed on Craft's 20 Big Shows Beech D-18, including carburetor air scoops, stabilizer angle of incidence change, landing gear doors, extended tail wheel, extended wing tips and new instrument panel. . . . Lear L-2 autopilot with altitude control was installed in Silas D. Sinton's Twin-Bonanza from Paisley, Oregon. . . . Collins equipment and dual ARC ADF's were installed in a new Travel Air for Charles G. Huntington and the Collins gear included two transmitters, three receivers, two omnis, glideslope, three-light marker and audio amplifier. . . . A new K-35 Bonanza of Edgerton, Germeshausen & Grier, Las Vegas, was delivered to Planeservice for installation of a Narco 1016 Sapphire, dual omni, ADF and marker receiver. . . . Planeservice installed a new Narco Mark V and a VOA-3 omni converter in Melvin Klaguers' Apache. . . . O. J. Plummer's Bonanza received an engine change, Tactair autopilot, Narco Mark V and VOA-3 omni converter.

DELAWARE AVIATION CORP., Piper distributor at Philadelphia International Airport, is expanding its activities to include North Philadelphia Airport where it will become the fixed-base operator. Bun DeWeese, general manager, said his firm will establish on the North Philadelphia field, which is away from heavy traffic but convenient to business centers, complete aircraft sales, charter, air taxi, rentaplane and flight school op-

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COMMENDATION FOR HELICOPTER RESCUE AND HUMANITARIAN SERVICE has been presented by the California Aeronautics Commission to Thomas R. Scharf, pilot for Rick Helicopters, Inc., San Francisco, who rescued a stricken utility company tender, John Landry, from an isolated, snowbound area of the Sierra Nevada Mountains. Landry would have died from a burst appendix except for his rescue by Scharf, who removed him by helicopter despite extremely hazardous altitude, weight and wind conditions. Pilot Scharf is at left above, with James S. Ricklefs (right), president of Rick Helicopters, who was also awarded a certificate of merit for his firm's public service policy which makes his copters available in emergencies without thought of risk or recompense. Rick's copters work all over the world. The awards were presented by Norman Larson, (center), aircraft sales operator who is chairman of the California Aeronautics Commission.

erations, including courses designed for businessmen and women who want to learn to fly.

EXECUTIVE AIRCRAFT, Kansas City Municipal Airport, has named Dal C. Miller as vice president and general manager, according to Virgil Hackett, president. Miller joined Executive from Dixie Air Associates at Memphis, where he was president and manager for ten years. Executive Aircraft is Kansas City's largest fixed-base operator and sells, leases, rents and maintains company and private aircraft and operates a flight school.

AIR TERMINAL SERVICES, INC., International Arrivals Building. New York, has established an independent flight control center offering complete and integrated dispatch, flight watch and related services to both domestic and international carriers. Peter J. Nelson is president; Anthony L. Doyle is executive vice president, and Albert Trop is operations manager.

DAY-GLO DAYLIGHT FLUORESCENT AIRCRAFT PAINT is being used by the Navy to mark its aircraft, 30,000 gals. of the paint being furnished by Switzer Brothers, Inc., Cleveland. The manufacturer had previously sold 50,000 gals. to the Air Force for marking 13,000 non-tactical aircraft against mid-air collisions.

FREDERICK B. AYER & ASSOCIATES, New York, has sold three of the Convair 240's it acquired from American Airlines and has leased two others to corporations. Two have been optioned to prospective purchasers and one is being operated as a demonstrator. Two of the sales were to Southeast Air Lines and the third was to a corporation for executive transportation. . . . **JAMES C. WELSCH,**

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414 Civil Aircraft in Government Fleet

A fleet of 414 aircraft will be operated by civil agencies of the U. S. government during fiscal 1960.

It will cost $30,244,990 in expenses to operate and maintain this fleet of aircraft.

New aircraft purchases will number 31 planes and they will cost the government $12,795,500.

Largest civil aircraft fleet in government operation will be the U. S. Coast Guard's 132 aircraft — used in search and rescue duties, logistics support and personnel transportation.

The Federal Aviation Agency, formerly the CAA, will operate 117 aircraft as the next largest government civil fleet. These FAA aircraft include three new twin-jet planes, equipped with elaborate electronic gear for checking and testing air navigation facilities. FAA fleet aircraft are used for developing flight safety standards, operational training, flight proficiency and logistic support of stations located in Alaska and in Pacific areas.

Seven agencies of the Department of Interior will operate 70 aircraft including helicopters for emergency Bonneville Power Administration power line patrols and another aircraft assigned to the Everglades National Park for the detection of poachers and for search and rescue in protection of visitors.

The Immigration and Naturalization Service of the Department of Justice will operate 33 aircraft for border patrols, pursuit of suspected violators, transfers of patrol inspectors to points of emergency and in the deportation of aliens.

A major government use of civil aircraft is performed by the Forest Service of the Department of Agriculture. It will operate 33 aircraft for transportation of smokejumpers to inaccessible areas for reconnaissance and suppression of large fires and for pest control activities.

n aviation for 35 years and until recently operator of his own aircraft sales firm, is now vice president in charge of sales for Frederick B. Ayer & Associates. He was sales manager of the predecessor company of Aeronca in marketing the vrst lightplane licensed by the government in 1929 and later served as sales manager for Stinson. Welsch has been associated with Ayer in selling Convair 240's for the last several months and is accompanying the Ayer demonstrator on its national tour of business flying centers.

CORPORATE AIRCRAFT SERVICE, Detroit City Airport, has been appointed a Class A dealer by Airwork Corp. to handle Airwork engines and accessories on sale or exchange basis. Harry Hogan, Corporate Aircraft Service president, was chief of maintenance for Fruehauf Trailer's aviation operation for ten years. Norman Grele and Bob Kruse, associated with him as vice presidents, were senior captain and chief pilot, respectively, for Fruehauf. . . . Seaboard & Western Airlines has extended an engine and accessory overhaul contract with Airwork Corp., Millville, N. J., for another year, and CAA has granted a time extension to 1,600 hours on the R-2000-7102 engines overhauled by Airwork, according to John Gillespie, vice president.

FLIGHT LINE CORP., Sun Valley, Calif., has available to readers a new catalogue folder picturing its executive, crew and airline seats.

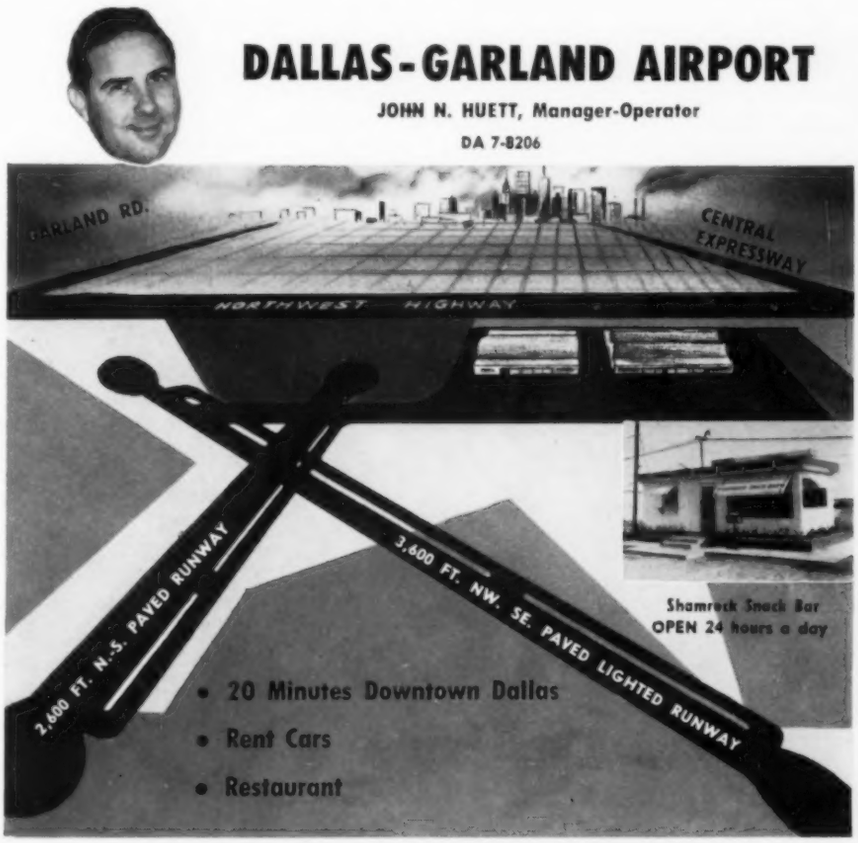
PROOF THAT AIRCRAFT MODERNIZATION AND PERFORMANCE KITS PAY OFF is shown in the operations of Sinclair Oil's aircraft fleet for the year of 1958. Sinclair planes used 397 airports in each of the 48 states except Vermont, making 7,643 flight in operating 1,895,919 miles flown and 12,602:20 hours flown. Average hours flown per aircraft were 548, average miles per flight 248, average hours per flight 1.71 and average speed 145 mph. Henry Boggess, aviation department manager, commented as follows: "In 1958 the Sinclair fleet flew the greatest number of miles in any year of operation with fewer airborne hours than in any previous year — this results from aerodynamic and modernization changes in our Lodestars and Twin Beeches which have stepped up speed, resulting in fewer operating hours, greater economy in operation and increased factors of safety."

FIFTEEN REGIONAL SERVICE CLINICS FOR AIRCRAFT MAINTENANCE OPERATORS are being conducted by the Tactair Division of Aircraft Products Co., Bridgeport, Conn., manufacturer of the Tactair autopilot. Tactair Manager R. B. Springer said the meetings cover all aspects of installation, maintenance and servicing of Tactair automatic flight systems and are open not only

Officials in Lockheed-Azcarate partnership are pictured above. Left to right are Lockheed President Courtlandt S. Gross, General Abelardo Rodriquez of Mexico and Lockheed Senior Vice President Charles A. Barker.

Lockheed Partner in Mexican Aircraft Factory

LIGHT utility aircraft designed to operate in Latin America will be manufactured in Mexico by a new company formed by a partnership of business and industrial interests in Mexico City with Lockheed Aircraft Corp. The new firm is Lockheed-Azcarate, S. A., with majority ownership held by Mexican interests headed by General Abelardo Rodriquez and General Juan Azcarate. Lockheed's Georgia Division will supply the light utility aircraft design prototypes and necessary tooling, which will be shipped to Mexico where first flights are expected later this year. Al W. Mooney, famous American engineer who formerly manufactured his own lightplanes and now with Lockheed, is manager of engineering for the Mexican project.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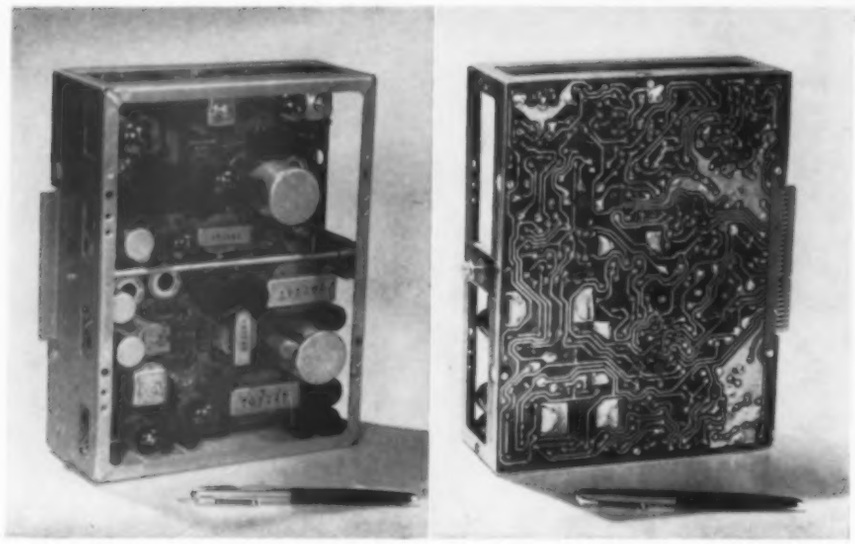

NAVIGATION MODULE OF NEW LEAR NAVPAC-100 FOR PRIVATE AIRCRAFT is compact unit weighing only 4.5 lbs. and fitted in small package only 3 by 7 1/4 by 9 1/5 inches. Note size of fountain pen. Included in Lear's new line of top-quality lightweight radio equipment, it is adaptable to any VHF receiver having omni-localizer capability. The unit features exclusive automatic omni and localizer switching, an aural marker beacon receiver and etched circuitry. It is capable of operating three meter loads and two flag alarms and can also operate two meter loads and two warning flags and an approach coupler without additional amplification.

to all Tactair service agency personnel but also to any fixed-base operators who conduct maintenance operations. Tactair Service Manager Lee Sierp is in charge. The series of clinics got under way on January 26 at Atlantic Aviation in New Castle, Delaware, and subsequent clinics were scheduled for Cleveland, Rockford, Ill., Omaha, Wichita, Denver, Billings, Portland, San Francisco, Los Angeles, Phoenix, Fort Worth, Memphis, Charlotte and Fort Lauderdale.

ULTRASONIC CLEANING IS CUTTING AIRCRAFT ENGINE MAINTENANCE AND OVERHAUL COSTS by cleaning parts faster and with greater precision, according to Narda Ultrasonics Corp., Westbury, N. Y. The firm builds fully automatic push-button ultrasonic vapor degreasers for the Air Force and expects the units will soon be installed in commercial aircraft shops. Pistons, oil strainers, spark plugs, valves, hydraulic parts, bearings and other parts are thoroughly cleaned quickly in an automatic process.

ELECTRONICS EQUIPMENT ENGINEERING COMPANY of Dallas has appointed the George Agency of Newhall, California, as its West Coast representative. Headed by W. D (Bill) Price, Jr., EEE performs all types and phases of electronics research, development, engineering and manufacturing for the aviation industry.

PACIFIC AIRMOTIVE CORP., Burbank, has purchased Lear, Incorporated's 70,000-share stock interest in PAC for approximately $250,000 in cash. The stock was originally issued to Lear as part payment for Lear's aircraft engineering division, which developed the Learstar.

BENDIX RDR-1D WEATHER RADAR SALES reached a seven-month high mark in December with 12 complete systems going to executive aircraft customers all over the country.

SOUTHWEST AIRMOTIVE, Love Field, Dallas, has opened two new district offices and warehouses in Houston and St. Louis. Paul Kennedy, vice president in charge of parts distribution, said the new Houston district headquarters is at 8700 Travelaire on Municipal Airport and the new St. Louis district headquarters is on Lambert Field. B. W. Jackson is manager of the firm's Midwest Region headquartered at Fairfax Airport in Kansas City with George Scholtz as his assistant manager. Billy Prewitt was

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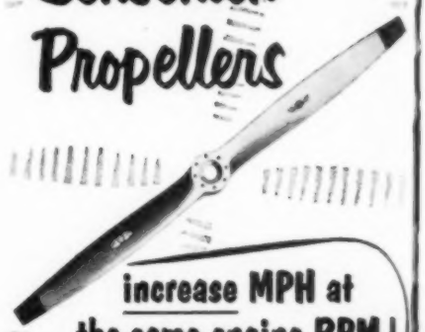

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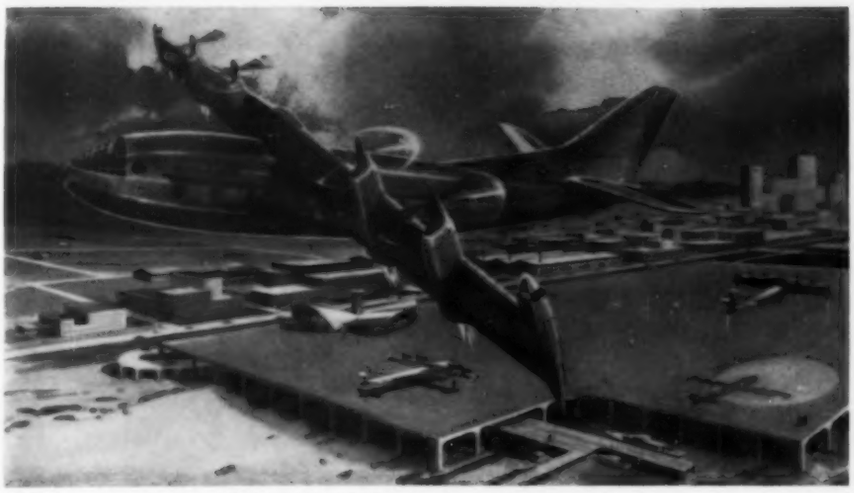

HILLER CONCEPT OF TILT-WING VTOL AIRLINER, based on research X-18 full-scale prototype now nearing flight tests, is pictured in this artist's sketch. Wing and engines tilt to vertical position for take-off and landing and to normal horizontal position for cruise flight. Relatively small midtown terminals could handle VTOL airliners.

—(Hiller Aircraft Sketch.)

transferred from Kansas City to manage the new St. Louis operation. Sales Manager Dutch Barbettini has announced the promotions of Richard Seger to be commercial sales supervisor and Paul Ivey to be trade sales supervisor.

AIRCRAFT SALES COMPANY, Meacham Field, Fort Worth, Cessna distributor, has appointed Gerald Spear as vice president and general sales manager. Spear was formerly regional sales manager for Cessna Aircraft Company in the Texas-New Mexico area.

CIRCULATING HOT OIL RADIANT HEATING features a new hangar at Peterson Field, Colorado Springs. The Burnham Aircraft, Inc., hangar is an all-metal Butler building is insulated and is heated by hot oil circulated through coils imbedded in the floor. A Childers Circulating Hot Oil Heater was installed by Childers Manufacturing Co., Albuquerque, New Mexico, and Drew Plumbing Co. Four separate pipe circuits are automatically controlled by thermostats to maintain desired temperatures. The circulating hot oil not only heats the hangar, offices and shops but the outside ramp, too, where radiant heat clears ice and snow from the surface.

AIRWORK CORP., Millville, N. J., has added three more Class A dealers for Airwork overhauled engines and accessories, bringing to 38 the total number of Class A dealers. Newest appointments are AeroMech, Inc., Benedum Airport, Clarksburg, West Virginia; Cannon Aircraft Sales & Service, Inc., Douglass Airport, Charlotte, N. C., and Linden Flight Service, Linden Airport, Linden, N. J.

E. STACK GATELY is now a customer relations representative assisting Laurance G. Henderson in the international sales of the Fairchild F-27 propjet Friendship, according to R. James Pfeiffer, Fairchild vice president. Gately was formerly staff representative with North American Aviation's export sales.

EAST COAST AVIATION CORP., Bedford Airport, Lexington, Mass., performed progressive inspection on Harold Morgenstern's Laboratory for Electronics Convair 240. . . . Miscellaneous work was performed for the Holliston Mills DC-3, John Briggs, chief pilot, and an FAA (CAA) DC-3, with Clyde Hudnall in attendance.

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EXCITING NEWS See Page 61

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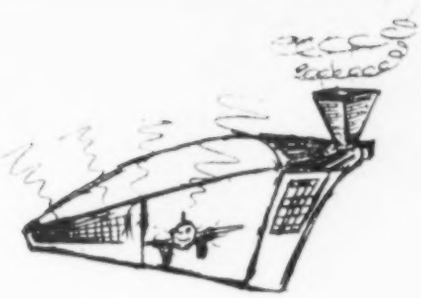
of heated hangar



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1250 total hours, Collins 17L, dual 51R3 VOR with 51V, A.R.C. standby, ADF, dual instrumentation, boots, 282 fuel, etc.

Grumman Goose Amphibian

NTSO, Hartzell props, metal wings, new interior and exterior.

E50 Twin Bonanza

1957 model, 330 total hours. A.R.C. ADF, dual VOR-ILS, Course Director, Sapphire VHF, air conditioner, Hartzell props, 230 fuel, couch, table, oxygen, etc.

Custom 18

NTSO, big windows, hydromatics, boots, airstair, Custom interior, Collins 51R VOR-ILS, A.R.C. omni, 210 VHF, T11, ADF, iso-amp, speakers, dual instrumentation, etc.

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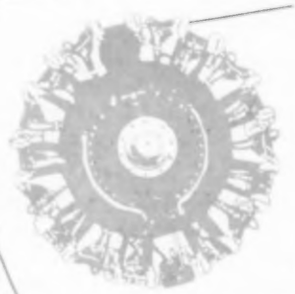

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